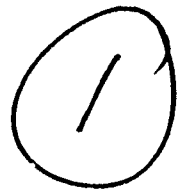


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UNITED STATES AIR FORCE



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EPI REPORT

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ELECTRONIC PRINCIPLES INVENTORY

LOWRY TECHNICAL TRAINING CENTER

AFPT 90-EPI-825

MARCH 1990

OCCUPATIONAL ANALYSIS PROGRAM
USAF OCCUPATIONAL MEASUREMENT CENTER
AIR TRAINING COMMAND
RANDOLPH AFB, TEXAS 78150-5000

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PREFACE

This report presents the results of an Air Force Electronic Principles survey of 37 selected Air Force specialties. Authority for conducting Electronic Principles (EP) surveys is contained in AFR 35-2.

Results presented in this report are part of an EP survey of 81 Air Force specialties. This survey was requested by the Chief, Common Electronics Training Program (CETP) Program Management Team (PMT) in October 1985.

The Electronic Principles Inventory (EPI) used to collect EP survey data was originally developed in 1976 by Dr Hendrick Ruck and Major Thomas O'Connor. Mr Theodore Wilcox revised and validated the EPI in 1986 as part of this survey project.

First Lieutenant Robert Hampel analyzed the data and wrote the final report. Computer programming support was provided by Ms Olga Velez and Mr Wayne Fruge, and Ms Raquel A. Soliz provided administrative support. This report was reviewed and approved by Mr Gerald Clow, Chief, Management Applications Branch, Occupational Analysis Division, USAF Occupational Measurement Center.

This report is distributed to Air Staff sections, major commands, and other training and management personnel. Requests for additional copies should be sent to: Chief, Occupational Analysis Division (OMY) USAF Occupational Measurement Center, Randolph AFB, Texas 78150-5000.

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REPORT SUMMARY

1. BACKGROUND: This report provides data on the electronic principles (EP) used by airmen in 37 Air Force specialties (AFSS) with initial training at Lowry Technical Training Center (TTC).

2. METHODOLOGY: The USAF Electronic Principles Inventory (AFPT 90-EPI-825) was administered to random samples of fully qualified job incumbents representing the 37 AFSS in this report. The data were collected from March 1987 to March 1989. Some AFSCs have been affected by RIVET Workforce changes. Details are enumerated in the SURVEY ADMINISTRATION section.

3. RESULTS: Complete survey data is provided in two appendices:

Appendix A: Lowry TTC AFSCs EP data in EPI
job inventory order

Appendix B: Lowry TTC AFSCs EP data matched to
Electronic Fundamentals/Applications
(EF/A) STS

NOTE: A "generic" version of the Electronic Fundamentals/Applications (EF/A) is used in Appendix B--complete analysis requires the use of AFSC-specific proficiency codes, rather than the generic set used in the appendix.

4. DISCUSSION AND IMPLICATIONS: Although there is no specific regulatory guidance on the use of EPI data, the survey data lends itself to the use of cutoff scores for deciding which EPI items to include in centralized training for each AFSC. Once the training needs of the individual AFSCs have been determined, the possibility for consolidated EP training can be considered.

Survey data showed that AFSC 40450 personnel use as many or more EPI items than nine of the 32 AFSCs in this report which currently attend the Lowry EP course. AFSC 404X0 personnel should be considered for enrollment in the course.

There was no match of EPI survey data to the Lowry EP course POI, because the POI was undergoing major revisions. This match should be accomplished once the new POI is complete, to determine whether or not the survey data support the new POI objectives.

ELECTRONIC PRINCIPLES SURVEY REPORT LOWRY TECHNICAL TRAINING CENTER

INTRODUCTION

From missile systems maintainers to telephone switching specialists, from avionics technicians to biomedical equipment personnel, the US Air Force employs more than 50,000 worker-level (primarily 5-skill level) personnel who require electronic principles (EP) training. These highly skilled, technically trained airmen work in over 80 Air Force specialties (AFSS) spanning 11 career fields. Furthermore, the depth and breadth of required EP training varies based on specialty needs. In short, the USAF spends vast amounts of money, manpower, and time to ensure that airmen are properly trained in electronic principles.

To make the best use of these resources, the USAF Common Electronics Training Program (CETP) was designed to consolidate and standardize Air Force EP training where possible and practical. This is primarily accomplished through special EP courses taught at four USAF Technical Training Centers (TTCs). These EP courses teach the electronic principles common to two or more AFSSs. Another part of the CETP is the development of common training modules. Specific blocks of EP instruction are developed by one TTC, then shared with the other TTCs which teach that EP subject. By selectively combining and standardizing Air Force EP training, the USAF makes best use of limited training resources. (SDND)

Not all Air Force electronic principles training is conducted in special EP courses, however. For example, some EP subjects are used in only one AFSS. Students learn these generally advanced topics in AFSC-awarding courses, building on the more basic EP subjects from the common EP course. Also, some AFSSs require very few electronic principles, and airmen in these specialties receive EP training only in their AFSC-awarding courses.

As with other Air Force technical training, EP training programs can profit from objective analysis of specific training requirements. These requirements can be analyzed objectively using occupational survey data. This EP survey provides data which can be used to analyze the specific EP training requirements in CETP courses and AFSC-awarding courses alike. The instrument used to collect EP survey data is the Electronic Principles Inventory (EPI).

BACKGROUND

The USAF Electronic Principles Inventory (EPI) is a knowledge- and skills-based job inventory which identifies the electronic principles, skills, and equipment an airman uses in the performance of his or her job.

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The EPI was originally developed by Dr Hendrick Ruck and Major Thomas O'Connor in 1976. An in-depth discussion of the original concept, development, and validation of the EPI can be found in USAFOMC Technical Note 77-02, "The Development and Application of the Electronic Principles Job Inventory". Mr Theodore Wilcox revised and validated the EPI in 1986 for this survey.

The EPI contains two sections. First is a background section containing demographic and job satisfaction questions. The second section contains 712 electronic principles, skills, and equipment questions covering 39 EP subject areas. Below are some example questions taken from the EPI. The 39 EPI subject areas are listed in Table 1.

After completing the background section, job incumbents respond "Yes" or "No" to the 712 EPI questions. The result is a "profile" of electronic principles, skills, and equipment used by the incumbent in his or her present job. This electronic principles "profile" can be combined with the "profiles" of other job incumbents to produce a "profile" for the entire AFS.

EXAMPLE EPI QUESTIONS

Example Principles Questions

- A4-4 Do you use electron tube characteristic curves?
- G1-20 Do you use parity bit codes?
- H4-33 Do you use "FM" modulation principles?

Example Skills Questions

- C1-8 Do you calculate values of transistor amplifier voltage, current, or power gain?
- E2-1 Do you trace schematic or block diagrams of circuits containing frequency sensitive filters?
- I1-4 Do you measure RF effective power?

Example Equipment Questions

- B4-2 Do you use spectrum analyzers?
- D3-5 Do you perform tasks on variable resistor voltage regulators?
- J1-8 Do you work on dynamic microphones?

TABLE 1
EPI SUBJECT AREAS

<u>SUBJECT AREA NUMBER</u>	<u>SUBJECT AREA TITLE</u>
A1	Direct/Alternating Current
A2	Electro/Mechanical Devices
A3	Solid-State Circuits and Devices
A4	Tubes
A5	Soldering or Solderless Connections
B1	Multimeters
B2	Oscilloscopes
B3	Signal (Function) Generators
B4	Test Equipment
C1	Transistor Amplifier Circuits
C2	Transistor Amplifier Stabilization Circuits
C3	Coupling Circuits
C4	Electron Tube Amplifier Circuits
C5	Operational Amplifiers
C6	Magnetic Amplifiers
D1	Power Supply Circuits
D2	Power Supply Filters
D3	Power Supply Voltage Regulators
E1	Resistive Capacitive Inductive Circuits
E2	Frequency Sensitive Filters
F1	Oscillators
F2	Multivibrators
F3	Waveshaping Circuits
F4	Limiter/Clamper Circuits
G1	Digital Logic Numbering Systems and Functions
G2	Computers
G3	Digital Circuits
G4	Digital to Analog (D/A) and Analog to Digital (A/D) Converters
H1	Connections (Transmission Lines and Waveshaping Circuits)
H2	Microwave Oscillators and Amplifiers
H3	Resonant Cavities
H4	Transmitters and Receivers
H5	Antennas
I1	Radio Frequency Measurements
I2	Radio Frequency Calculations
J1	Microphones and Speakers
J2	Photosensitive Devices
J3	Storage Type Display Tubes
J4	Television, Laser, and Infrared Systems

SURVEY ADMINISTRATION

As mentioned in the PREFACE, data were collected for this survey from over 80 AFSCs (78 AFSCs, 3 Reporting Identifiers). Survey data were collected in four increments, from March 1987 through March 1989. A total of 24,651 EPI booklets were mailed to active duty airmen worldwide. After each of the first three increments, interim survey reports were published by the USAF Occupational Measurement Center (USAFOMC). These reports are all numbered AFPT 90-EPI-825, and are dated July 1988 (EPI-1), January 1989 (EPI-2), and February 1989 (EPI-3). There was no separate report of data collected in EPI-4. Results were combined with those of the first three increments to produce the final reports. There are a total of five final EPI reports, one for each of the following: Chanute TTC, Keesler TTC, Lowry TTC, Sheppard TTC, and the Air Force Military Training Center (AFMTC), located at Lackland AFB. This report presents results only for AFSCs with technical training courses at Lowry Technical Training Center.

A discussion about data collection and reporting procedures is necessary at this point. Some of the AFSCs included in this EP survey have been affected by RIVET Workforce (RWF) changes during various phases of the survey process. We have tried to keep up with these changes and adapt accordingly to provide the best, most useful survey data possible. Fortunately, not all AFSCs were affected by RWF, and some AFSCs were changed by RWF before survey mailout. These AFSCs did not require any special consideration.

Unfortunately, some AFSCs changed after survey data collection, which presented a challenge. Personnel from various AFSCs were reorganized and redistributed into new AFSCs as a result of RWF changes. These redistributed groups can be easily identified in this report because they carry the generic "X" for the skill-level designation. Using survey data collected from the 'old' AFSCs, we were able to create new data sets representing these 'new' AFSCs, allowing analysis of the data under the 'new' specialty structure.

For example, we collected survey data from the following AFSCs which no longer exist due to RWF changes: 32150, 32151E, 32151G, 32152, 32152Q, 32351, 32352, 32353, 32550, 32551, 32850, 32851, 32852, 32853, 32854, and 32855. These 'old' AFSCs were redistributed among several 'new' AFSCs as a result of RWF changes. The 'new' AFSCs which have initial training at Lowry TTC (and included in this report) include 451X7, 455X3A, 456X0, 456X2A, 456X2B, 457X3A, and 457X3C. As mentioned above, we recombined the survey data provided by airmen in the 'old' AFSCs to make new data sets which match the 'new' AFSCs, making analysis of EP training needs possible.

First, we placed all survey respondents from the 'old' AFSCs into a single group. Next, using the Uniform Airmen Record (UAR), we created a group which included all assigned personnel in the 'new' AFSCs. We then matched individuals by Social Security Account Number (SSAN), linking their 'old' AFSC to their 'new' AFSC. Finally, we created new data sets based on the results of the match, and these data sets represent the EP use of the personnel in the 'new' AFSCs. (NOTE: It was necessary to include 7-skill level personnel in the 'new' AFSC groups for matching purposes, because some of the personnel in

the 'old' AFSCs had upgraded to 7-level since taking the survey. However, the survey data are still useful, because the data were collected while the respondents were still 5-levels.)

After we performed the match of the 'old' AFSCs to 'new' AFSCs, we found that some of the 'new' AFSCs had sample sizes that were too small to be reliable. The following AFSCs are NOT reported here because of inadequate sample sizes: 455X3B, 455X3C, 455X5A, 455X5B, and 457X3B. However, most of the 'new' AFSC samples were sufficient for use, and are included in this report.

Here is a summary of all AFSCs included in this report:

<u>AFSC</u>	<u>TITLE</u>
30455	Television Equipment
30950	Space Systems Equipment Maintenance
31653	Instrumentation
32450	Precision Measurement Equipment Laboratory
40450	Visual Information Equipment Maintenance
45154A	F-15 Avionics Test Station and Component (Automatic Test Stations)
45154B	F-15 Avionics Test Station and Component (Manual and EW Test Stations and Consoles)
45155	F-16/A-10 Avionics Test Station and Component
45156A	F/FB-111 Avionics Test Station and Component (Automatic Equipment)
45156B	F/FB-111 Avionics Test Station and Component (Manual and EW Equipment)
451X7	B-1B Avionics Test Station and Component
45251A	F-15 Avionic Systems (Attack Control Systems)
45251B	F-15 Avionic Systems (Instrument and Flight Control Systems)
45251C	F-15 Avionic Systems (Communication, Navigation, and Penetration Aids Systems)
45252A	F-16 Avionic Systems (Attack Control Systems)
45252B	F-16 Avionic Systems (Instrument and Flight Control Systems)
45252C	F-16 Avionic Systems (Communication, Navigation, and Penetration Aids Systems)
45253A	F/FB-111 Avionic Systems (Attack Control Systems)
45253B	F/FB-111 Avionic Systems (Instrument and Flight Control Systems)
45253C	F/FB-111 Avionic Systems (Communication, Navigation, and Penetration Aids Systems)
45271	F-15 Avionic Systems Technician
45272	F-16 Avionic Systems Technician
45273	F/FB-111 Avionic Systems Technician
45550A	Photographic and Sensors Maintenance (Tac/Recon Electronic Sensors)

45550B	Photographic and Sensors Maintenance (Recon/Electro-optical Sensors)
455X3A	Weapon Control Systems (F-4E/G, AC-130, F-5E)
456X0	Bomb-Navigation Systems
456X2A	Defensive Fire Control Systems (AN/ASG-15)
456X2B	Defensive Fire Control Systems (AN/ASG-21, AN/ASG-33)
457X3A	B-1B Avionics Systems (Offensive Avionics Systems, CITS and Doppler Radar Systems)
457X3C	B-1B Avionics Systems (Communication, Navigation, and Defensive Avionic Systems)
46150	Munitions Systems
46250	Aircraft Armament Systems
46350	Nuclear Weapons
99104	Systems Repair Technician
99105	Scientific Measurements Technician
99106	Applied Sciences Technician

The survey administration for these 37 AFSCs was spread over all four increments of the EPI, from March 1987 through March 1989. To be eligible for the survey, airmen in these specialties had to have at least 4 weeks' experience in their job, could not be within 90 days of retirement nor expecting reassignment within 60 days. A random sample of survey eligible personnel was selected, and booklets were mailed to airmen worldwide. All useable EPI booklets that were returned to USAFOMC were included in the final samples. Table 2 shows the number of assigned personnel at the time of survey, as well as final sample size, for each AFSC in this report.

TABLE 2
SPECIALTY REPRESENTATION OF SURVEY SAMPLES

<u>DUTY AFSC</u>	<u>TOTAL ASSIGNED</u>	<u>SURVEY SAMPLE</u>
30455	287	208
30950	270	199
31653	288	237
32450	1,204	300
40450	193	114
45154A	314	141
45154B	325	164
45155	356	186
45156A	413	168
45156B	314	146
*451X7	127	34
45251A	329	125
45251B	219	82
45251C	249	92
45252A	281	85
45252B	302	105
45252C	303	98
45253A	323	97
45253B	210	61
45253C	261	68
45271	295	227
45272	307	271
45273	258	147
45550A	337	149
45550B	376	146
*455X3A	236	108
*456X0	348	111
*456X2A	93	29
*456X2B	58	19
*457X3A	111	28
*457X3C	116	19
46150	4,037	1,034
46250	5,640	1,616
46350	565	347
99104	238	144
99105	299	206
99106	171	119

* Denotes AFSCs affected by RIVET Workforce changes. For a complete description of these changes, refer to the SURVEY ADMINISTRATION section of this report.

RESULTS

Each completed EPI survey booklet shows which electronic principles the respondent uses in his or her present job. When the responses of all survey respondents from a specific group are combined, the results are shown as percent of group members using each of the 712 EP items. This listing of all EPI items and the percent of group members responding "Yes" is the EP "profile" of that group. Appendix A shows percent group members responding "Yes" information for all 712 EPI items, listed in EPI job inventory order.

To facilitate development of Specialty Training Standards (STSs), subject-matter experts (SMEs) matched EPI items to appropriate block(s) of the Electronic Fundamentals/Applications (EF/A) part of the STS, also known as the STS Attachment 2. For this study, a "generic" version of the EF/A STS was used for the match. All blocks of the EF/A were matched, and the proficiency codes are NOT specific to individual AFSCs. Still, this information (located in Appendix B) can be used to determine which blocks of the STS Attachment 2 should be included in individual STSs.

Subject-matter experts also matched EPI items to the objectives from Plans of Instruction (POIs) for Air Force courses which teach electronic principles. This match of EPI items to appropriate POI objective(s), when combined with survey data, shows how well the POI objectives are supported. For example, if many group members respond "Yes" to the EPI items matched to an objective, then that objective is considered well supported by survey data. If, however, few group members respond "Yes", the objective is not well supported.

For this EPI survey, however, no POI match was accomplished, because the Lowry EP POI was undergoing major revisions. This match of EPI items to the Lowry EP course POI objectives should be accomplished once the POI changes are complete. This match will show whether or not the new POI is supported by EPI survey data.

Following is a summary of the Appendices, which show the survey results:

Appendix A: Lowry TTC AFSCs EP data in EPI
job inventory order

Appendix B: Lowry AFSCs EP data matched to Electronic
Fundamentals/Applications (EF/A) STS

DISCUSSION AND IMPLICATIONS

We collect EPI data to assess the use of electronic principles by different Air Force specialties. For each AFSC surveyed, this data shows the percent members responding "Yes" to each of the 712 EPI items. We can use this data to select for each AFSC the items we wish to include in centralized

training. Once we've selected for each AFSC the EPI items we wish to include in centralized training, we can look for commonalities among those items for the possibility of combined electronic principles training.

How should we use the EPI data to select the items we wish to include in centralized training? Currently, there is no regulatory guidance on the use of EPI data for the development of centralized training programs (or STSs). ATC Regulation 52-22 states only that "EPI studies provide valuable information for curriculum development or validation in terms of percent members requiring a range of electronics principles knowledge in the performance of their job." Lacking direction from regulations, we must devise an intelligent method for using this data.

The EPI percent members responding "Yes" data lends itself to the use of a cutoff score for selecting items to teach in centralized training. For each AFSC, EPI items at or above the cutoff score are selected for centralized training, while items with scores below the cutoff (in percent members responding "Yes") are left for other training methods, such as on-the-job training (OJT). This cutoff score can theoretically be anything from 1 to 100 percent members responding "Yes". If we select 1 percent as our cutoff, we must train all airmen in all EPI items used throughout the AFSC. If 100 percent is selected, we will only train the EPI items used by every airmen within the AFSC. These cutoffs are the extremes, and we should find some middle ground for our cutoff score.

For example, if we select a cutoff score of 50 percent, it means that the EPI items we train will be used by at least every other student. Similarly, if we select items with 20 percent members responding "Yes" as our cutoff, we know that at least every fifth student will need to know those items. The task is to select a cutoff which provides training that is effective without being excessive. Therefore, the practical upper limit for this cutoff score should be 50 percent members responding "Yes" (any higher, and training would be ineffective). Twenty percent should be considered the practical lower limit (any lower, and training would be excessive).

Table 3 shows the total number of EPI items and the number of EPI items used by 30 percent of members for each AFSC in this report. This cutoff of 30 percent is only an example, but serves to show the trend of EP use among the AFSCs. Table 3 also shows which AFSCs currently attend the Lowry EP course. These data show that 40450 personnel report using more EPI items than nine of the 32 AFSCs in this report which currently attend the course. Management and training personnel for AFSC 404X0 should strongly consider sending their personnel through the Lowry EP course.

Because there was no match to the course POI, no comments can be made concerning the content of the Lowry EP course at this time. However, once the POI revisions are complete, the match should be done to see how well the new POI objectives are supported by the survey data for the AFSCs which attend the course. Such a review, using survey data, will provide the foundation for selection of EPI items to include in centralized training. Of course, other considerations will be important, such as whether or not the 404X0 personnel attend the course, scheduling considerations, and financial constraints. A

complete review and revision of the Lowry EP course, based on the EPI survey data and modified by these other considerations, should result in a plan for training which is mindful of each specialty's needs, while avoiding excesses that waste precious Air Force resources.

TABLE 3
NUMBER OF TOTAL EPI ITEMS USED/
NUMBER OF EPI ITEMS USED BY 30 PERCENT OF GROUP MEMBERS
(BY AFSC)

<u>DUTY AFSC</u>	<u>ITEMS USED BY 30 PERCENT</u>	<u>TOTAL USED</u>
*30455	324	691
*30950	399	703
*31653	138	681
*32450	498	707
40450	102	598
*45154A	311	704
*45154B	281	708
*45155	232	709
*45156A	277	698
*45156B	416	704
*451X7	405	675
*45251A	77	643
*45251B	54	487
*45251C	57	591
*45252A	51	670
*45252B	65	650
*45252C	62	653
*45253A	88	648
*45253B	79	570
*45253C	86	546
*45550A	202	710
*45550B	106	627
*455X3A	159	680
*456X0	170	669
*456X2A	143	495
*456X2B	106	389
*457X3A	78	486
*457X3C	112	410
46150	3	132
46250	20	220
46350	10	181
*99104	329	697
*99105	24	497
99106	15	292

* Denotes AFSCs which currently attend the Lowry EP course

T A B L E O F C O N T E N T S

Report	Element	Program	Title		
1.	RP0028	PRTHOD	Lowry TTC AFSCs (Inventory Order - 1 of 3)	PH0027	1
2.	RP0029	PRTHOD	Lowry TTC AFSCs (Inventory Order -2 of 3)	PH0028	31
3.	RP0030	PRTHOD	Lowry TTC AFSCs (Inventory Order - 3 of 3)	PH0029	61
4.	RP0040	PRTHOD	Lowry TTC AFSCs matched to EF/A STS (1 of 3)	PH0036	90
5.	RP0041	PRTHOD	Lowry TTC AFSCs matched to EF/A STS (2 of 3)	PH0037	144
6.	RP0039	PRTHOD	Lowry TTC AFSCs matched to EF/A STS (3 of 3)	PH0038	198

Report Option Table for Modules

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Report Option Table for Tasks

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Description of Reported Module Factors

Col Factor	Source vector	Title	Module Statement	Number Members	Mean	S.D.	Max	Min	Valid
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1 TITLE

Description of Reported Task Factors

Col Factor	Source vector	Title	Task Statement	Number Members	Mean	S.D.	Max	Min	Valid
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1 TITLE
 2 F0042
 3 F0043
 4 F0044
 5 F0054
 6 F0056
 7 F0057
 8 F0058
 9 F0059
 10 F0060
 11 F0061
 12 F0087

GP0045/PHP	All DAFSC 30455	208	33.99	27.55	92.79	.00	712
GP0046/PHP	All DAFSC 30950	199	36.46	25.01	95.48	.00	712
GP0047/PHP	All DAFSC 31653	237	18.65	19.18	94.09	.00	712
GP0057/PHP	All DAFSC 32450	500	48.25	28.91	100.00	.00	712
GP0059/PHP	All DAFSC 40450	114	13.53	21.57	99.12	.00	712
GP0060/PHP	All DAFSC 45154A	141	31.26	27.72	99.29	.00	712
GP0061/PHP	All DAFSC 45154B	164	28.96	23.92	100.00	.00	712
GP0062/PHP	All DAFSC 45155	186	25.55	22.99	97.31	.00	712
GP0063/PHP	All DAFSC 45156A	168	28.61	26.02	100.00	.00	712
GP0064/PHP	All DAFSC 45156B	146	37.38	25.47	99.32	.00	712
GP0110/PHP	All DAFSC 451X7	34	35.18	22.40	100.00	.00	712

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range			
					Mean	S.D.	Max	Min Valid
13	F0062	GP0065/PMP	All DAFSC 45251A	123	11.24	17.77	98.40	.00 712
14	F0063	GP0046/PMP	All DAFSC 45251B	32	7.95	16.95	98.78	.00 712
15	F0064	GP0067/PMP	All DAFSC 45251C	92	9.26	15.97	92.39	.03 712

Electronic Principles Inventory (EPI) data for Air Force specialties is presented below in job inventory order. Data for this report was collected from job incumbents during the period March 1987 - April 1989

Percent members responding "YES" is shown for each specialty listed. Where skill level is not specified, both 5 and 7 skill levels are included (e.g., DAFSC 000X0 includes 00050 and 00070).

For assistance in using this EPI printout phone USAFOMC/OMYA, at AUTOVON 487-6623.

D T Tsk Y Nbr	Task Title	304	309	316	324	404	451	451	451	451	451	451	452	452	452
		55	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B	51C

0001 EPI Electronic Principles Inventory

0002 I. General Electronic/Electricity

0003 I 1. A1 Direct/Alternating Current

A 1	A1-1 Do you use metric terms (example mili, kilo, mega)	79	89	77	98	68	84	82	79	85	80	91	60	71	60
A 2	A1-2 Do you use basic DC electrical/electronic terms	93	95	94	100	98	98	96	97	98	99	100	87	99	88
A 3	A1-3 Do you use basic AC electrical/electronic terms	91	95	91	100	96	96	96	97	99	97	100	86	98	87
A 4	A1-4 Do you trace schematic or block diagrams of circuits containing conductors, fuses, lamps, switches, or batteries	89	93	86	99	95	99	99	94	99	98	97	90	99	79
A 5	A1-5 Do you troubleshoot circuits containing conductors, fuses, lamps, switches, or batteries	91	90	85	98	96	96	96	87	98	96	94	76	99	75
A 6	A1-6 Do you calculate values of DC voltage, current, resistance, or power	61	56	54	91	39	69	63	48	64	70	74	24	16	20
A 7	A1-7 Do you calculate values of AC effective voltage, average voltage, or peak-to-peak voltage	57	56	47	87	30	67	63	48	71	67	74	21	9	13
A 8	A1-8 Do you calculate values of frequency, phase relationship, or wave length	61	63	48	86	23	68	65	48	76	77	74	22	7	14
A 9	A1-9 Do you trace schematic or block diagrams of circuits containing resistors	90	92	79	98	88	95	95	85	98	97	91	30	61	32
A 10	A1-10 Do you troubleshoot circuits to isolate a faulty resistor	89	81	70	98	82	77	74	60	91	90	76	13	33	10
A 11	A1-11 Do you calibrate or adjust circuits by using variable resistors	88	87	74	98	73	88	91	84	92	92	82	8	34	12
A 12	A1-12 Do you calculate the value of a resistor required for a circuit	53	45	45	87	46	45	34	30	44	51	53	6	12	4

D	T	Task	Task Title	304	309	316	324	404	451	451	451	451	451	451	452	452	452	452
Y	T	Nbr		55	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B	51C	
A	13	A1-13	Do you determine ohmic value of a resistor using the color code	88	72	73	96	76	74	62	47	79	88	74	6	12	7	
A	14	A1-14	Do you ohm check resistors	90	85	80	98	86	90	90	80	95	92	88	15	39	20	
A	15	A1-15	Do you trace schematic or block diagrams of circuits containing relays	72	82	68	92	88	99	98	91	99	99	88	84	95	82	
A	16	A1-16	Do you troubleshoot circuits to isolate a faulty relay	71	76	61	90	90	96	98	78	99	99	91	77	94	75	
A	17	A1-17	Do you adjust relays	37	34	26	52	53	27	23	17	36	29	35	20	12	11	
A	18	A1-18	Do you perform tasks on contacts, cores, coils, armatures, or springs	55	41	26	64	73	38	32	17	34	39	35	20	17	11	
A	19	A1-19	Do you continuity check relays	67	71	60	90	85	94	93	75	96	95	76	63	83	66	
A	20	A1-20	Do you trace schematic or block diagrams of circuits containing inductors, chokes, or choke coils	83	83	41	87	41	63	62	48	68	70	65	18	16	16	
A	21	A1-21	Do you troubleshoot circuits to isolate a faulty inductor, choke, or choke coil	80	74	31	82	35	42	48	26	54	62	53	7	11	5	
A	22	A1-22	Do you calculate values of circuit total inductance	24	26	14	48	11	17	18	8	15	23	21	5	2	1	
A	23	A1-23	Do you calculate values of circuit or component inductive reactance	25	23	15	49	10	16	16	8	14	19	24	5	2	1	
A	24	A1-24	Do you calculate values of circuit voltage or current in circuits containing inductors	33	31	17	60	11	18	22	11	20	25	24	4	2	2	
A	25	A1-25	Do you calibrate or adjust circuits by using variable inductors	72	52	22	79	18	37	37	17	28	51	38	5	4	1	
A	26	A1-26	Do you ohm check inductors	78	66	30	74	35	46	43	29	52	53	50	7	12	5	
A	27	A1-27	Do you trace schematic or block diagrams of circuits containing capacitors	91	89	69	97	83	91	88	82	97	94	79	26	62	28	
A	28	A1-28	Do you troubleshoot circuits to isolate a faulty capacitor	91	80	61	96	82	64	70	49	90	86	71	10	49	9	
A	29	A1-29	Do you calculate values of circuit total capacitance	32	27	25	58	27	25	23	13	24	27	26	6	12	3	
A	30	A1-30	Do you calculate values of circuit or component capacitive reactance	27	25	24	55	22	23	20	11	20	22	24	6	12	2	
A	31	A1-31	Do you calculate values of circuit or component voltage or current in circuits containing capacitors	37	32	25	68	26	27	15	26	27	24	4	12	2		
A	32	A1-32	Do you calibrate or adjust circuits using variable capacitors	76	56	35	94	31	52	55	27	31	66	47	2	35	2	
A	33	A1-33	Do you ohm check capacitors	84	73	46	84	70	65	63	45	77	74	56	11	44	10	
A	34	A1-34	Do you use capacitor color codes in your present job	25	21	18	48	25	18	18	9	16	18	24	6	5	2	
A	35	A1-35	Do you trace schematic or block diagrams of circuits containing transformers	89	81	61	96	85	86	84	76	97	86	82	27	41	24	
A	36	A1-36	Do you troubleshoot circuits to isolate a faulty transformer	88	74	51	94	82	75	73	53	96	82	82	16	27	5	
A	37	A1-37	Do you calculate transformer voltage or current step-up or step-down ratios	37	31	24	67	42	34	29	17	39	32	32	6	4	1	
A	38	A1-38	Do you calculate impedance of transformers	24	17	16	42	19	23	16	11	20	16	24	7	2	1	
A	39	A1-39	Do you calibrate or adjust circuits using variable transformers	44	39	16	68	35	35	33	22	42	47	35	4	7	2	
A	40	A1-40	Do you ohm check transformers	83	61	43	84	69	55	55	41	75	61	68	14	20	5	
A	41	A1-41	Do you measure transformer output voltage	86	66	51	93	77	75	69	55	85	75	65	13	24	7	
A	42	A1-42	Do you trace schematic or block diagrams of circuits containing three phase transformers	31	55	27	55	37	67	59	46	71	64	68	17	18	9	

D T Y	Task Nbr	Task Title	304	309	316	324	404	451	451	451	451	451	451	452	452	452
A	43	A1-43 Do you troubleshoot circuits to isolate a faulty three phase transformer	55	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B	51C
A	44	A1-44 Do you adjust three phase transformers	27	49	24	50	32	58	51	33	67	58	62	11	13	5
			17	24	11	36	18	33	23	23	43	37	41	4	4	1
0004	1.2.	A2 Electro/Mechanical Devices														
A	45	A2-1 Do you trace schematic or block diagrams of circuits containing DC motors	70	66	27	44	83	50	39	34	46	F1	50	18	46	5
A	46	A2-2 Do you troubleshoot circuits to isolate a faulty DC motor	70	61	24	42	85	48	37	33	45	49	53	12	39	4
A	47	A2-3 Do you troubleshoot DC motor component parts	39	33	12	25	61	14	15	11	20	21	32	5	11	1
A	48	A2-4 Do you perform tasks on DC motor component parts	36	33	14	24	58	12	15	12	15	18	29	4	5	1
A	49	A2-5 Do you trace schematic or block diagrams of circuits containing AC motors	52	63	24	38	79	53	45	37	52	51	59	16	43	5
A	50	A2-6 Do you troubleshoot circuits to isolate a faulty AC motor	54	60	20	56	82	48	45	35	52	48	59	9	34	4
A	51	A2-7 Do you troubleshoot AC motor component parts	30	29	11	20	58	15	15	9	21	18	38	4	9	1
A	52	A2-8 Do you perform tasks on AC motor component parts	29	29	11	20	58	12	16	10	16	18	32	5	5	1
A	53	A2-9 Do you trace schematic or block diagrams of circuits containing DC generators	17	20	14	43	11	31	30	20	22	29	47	14	18	5
A	54	A2-10 Do you troubleshoot to isolate a faulty DC generator	18	19	12	39	10	30	26	18	22	27	50	9	12	3
A	55	A2-11 Do you troubleshoot DC generator component parts	15	14	8	38	7	12	12	7	13	22	21	4	4	1
A	56	A2-12 Do you perform tasks on component parts of DC generators	15	13	6	37	6	9	10	6	11	19	18	3	4	1
A	57	A2-13 Do you trace schematic or block diagrams of circuits containing AC generators	13	23	12	46	8	30	29	18	21	25	53	14	20	5
A	58	A2-14 Do you troubleshoot circuits to isolate a faulty AC generator	13	20	9	62	7	28	26	16	23	21	53	10	12	3
A	59	A2-15 Do you troubleshoot AC generator component parts	11	15	6	41	4	11	11	6	13	19	18	4	1	1
A	60	A2-16 Do you perform tasks on component parts of AC generators	11	16	6	40	4	9	10	7	11	17	18	2	2	1
A	61	A2-17 Do you trace schematic or block diagrams of circuits containing alternators	3	6	3	5	4	5	7	8	5	4	6	6	12	3
A	62	A2-18 Do you troubleshoot circuits to isolate a faulty alternator	3	4	2	4	4	4	5	5	5	4	3	2	12	2
A	63	A2-19 Do you troubleshoot alternator component parts	3	3	1	4	4	2	2	3	2	3	3	1	2	1
A	64	A2-20 Do you perform tasks on component parts of alternators	3	3	1	4	4	1	2	2	2	3	3	1	1	1
A	65	A2-21 Do you trace schematic or block diagrams of circuits containing synchros or servos	57	65	23	60	12	60	62	61	83	49	68	49	89	21
A	66	A2-22 Do you troubleshoot circuits to isolate a faulty synchro or servo	57	62	21	56	11	55	62	48	82	49	65	38	83	18
A	67	A2-23 Do you troubleshoot synchro or servo component parts	43	41	14	43	6	18	25	17	42	20	47	15	38	7
A	68	A2-24 Do you perform tasks on component parts of synchros or servos	44	39	15	40	6	14	18	14	37	18	47	13	12	7
A	69	A2-25 Do you trace schematic or block diagrams of circuits containing choppers	11	8	7	48	7	2	9	13	14	18	32	10	12	3
A	70	A2-26 Do you troubleshoot circuits to isolate a faulty chopper	11	6	6	48	5	16	7	8	12	16	29	6	13	1

Task Y Nbr	Task Title	304	309	316	324	404	451	451	451	451	451	451	452	452	452
A 71	A2-27 Do you measure chopper coil excitation frequency	8	4	3	38	2	9	1	4	5	8	9	3	7	1
A 72	A2-28 Do you measure chopper coil voltage-current phase relationship	6	3	3	23	2	9	1	3	6	5	9	3	7	1
A 73	A2-29 Do you trace schematic or block diagrams of circuits containing transducers	18	18	32	45	4	38	22	48	17	23	41	16	74	8
A 74	A2-30 Do you troubleshoot circuits to isolate a faulty transducer	18	17	33	44	4	30	20	40	17	21	38	11	67	3
A 75	A2-31 Do you calibrate or adjust transducers	13	14	27	44	4	14	8	31	11	10	38	5	62	2
A 76	A2-32 Do you repair, clean or lubricate transducers	17	15	24	32	4	12	10	19	10	8	32	5	21	1
A 77	A2-33 Do you trace schematic or block diagrams of circuits containing solenoids	61	55	20	29	75	43	47	30	25	33	38	13	48	4
A 78	A2-34 Do you troubleshoot circuits to isolate a faulty solenoid	61	50	20	29	80	38	42	23	24	30	38	9	39	3
A 79	A2-35 Do you perform maintenance on solenoid component parts	41	27	13	15	58	19	21	10	11	12	26	5	2	0
A 80	A2-36 Do you trace schematic or block diagrams of circuits containing meter movements	59	60	36	91	38	46	55	39	52	49	56	16	26	11
A 81	A2-37 Do you troubleshoot circuits to isolate a faulty meter movement	57	53	32	90	38	36	45	30	49	47	53	11	23	9
A 82	A2-38 Do you perform maintenance on meter movement mechanical parts	34	28	16	69	27	10	18	10	20	19	26	5	4	4

0005 Y 3. A3 Solid State Circuits and Devices

A 83	A3-1 Do you trace schematic or block diagrams of circuits containing diodes	89	89	66	97	67	94	92	82	95	95	88	34	70	38
A 84	A3-2 Do you troubleshoot circuits to isolate a faulty diode	89	82	63	96	65	77	80	56	94	92	85	21	49	18
A 85	A3-3 Do you check diodes using an ohmmeter	89	82	65	96	69	79	85	64	92	93	79	18	48	21
A 86	A3-4 Do you use diode characteristic curves	26	21	16	62	15	11	9	8	18	25	21	3	0	1
A 87	A3-5 Do you use diode substitution information	67	47	34	81	20	16	19	12	39	45	50	4	1	1
A 88	A3-6 Do you use diode color codes	24	18	13	35	18	13	12	8	14	23	26	8	2	4
A 89	A3-7 Do you trace schematic or block diagrams of circuits containing transistors	90	88	70	97	73	91	93	80	98	97	82	26	40	32
A 90	A3-8 Do you troubleshoot circuits to isolate a faulty transistor	90	81	62	97	70	74	79	54	96	91	79	13	16	5
A 91	A3-9 Do you check transistors using an ohmmeter	90	80	59	96	69	67	74	53	92	90	68	10	13	5
A 92	A3-10 Do you check transistors using transistor testers	82	46	32	89	38	28	27	15	48	45	47	6	1	1
A 93	A3-11 Do you use transistor characteristic curves	28	19	18	62	12	11	11	4	15	21	21	3	0	1
A 94	A3-12 Do you use transistor substitution information	78	56	41	87	26	21	20	12	39	50	44	5	0	1
A 95	A3-13 Do you trace schematic or block diagrams of circuits containing integrated circuits (IC)	88	89	66	95	55	95	87	81	86	94	88	34	50	30
A 96	A3-14 Do you troubleshoot circuits to isolate a faulty IC	89	79	61	95	47	77	70	46	82	87	79	13	24	8
A 97	A3-15 Do you use IC substitution information	77	60	52	84	25	33	34	16	36	51	44	6	2	4
A 98	A3-16 Do you trace schematic or block diagrams of circuits containing solid-state special purpose devices	70	74	46	86	36	60	60	51	55	74	62	26	16	15
A 99	A3-17 Do you troubleshoot circuits to isolate a faulty solid-state special purpose device	70	70	42	85	32	50	51	29	52	69	62	13	9	5
A 100	A3-18 Do you perform tasks on varactors/varicaps	50	42	13	67	11	21	29	11	18	33	32	6	1	3
101	A3-19 Do you perform tasks on tunnel diodes	20	37	7	83	11	18	26	5	21	37	26	2	1	2

D T Tsk Y Nbr	Task Title															
		304	309	316	324	404	451	451	451	451	451	451	451	451	452	452
A 102	Do you perform tasks on field effect transistors (FET)	56	45	19	82	20	34	34	13	39	63	44	7	1	3	3
A 103	Do you perform tasks on unijunction transistors (UJT)	83	73	51	93	45	60	60	33	67	79	47	11	13	8	8
A 104	Do you perform tasks on zener diodes	44	43	33	82	25	38	37	23	40	41	47	13	7	5	5
A 105	Do you perform tasks on liquid crystal displays (LCD)	19	27	18	72	18	17	35	12	12	55	29	6	2	2	2
A 106	Do you perform tasks on pin diodes	72	76	53	89	45	58	52	44	50	66	56	24	13	9	9
A 107	Do you perform tasks on light emitting diodes (LED)	16	17	4	38	9	11	11	4	8	15	12	3	1	2	2
A 108	Do you perform tasks on fanall transistors	70	71	23	83	34	26	34	11	40	49	50	9	1	4	4
A 109	Do you perform tasks on silicon controlled rectifiers (SCR)	25	24	9	45	29	11	18	5	16	21	18	9	2	3	3
A 110	Do you perform tasks on triacs	11	11	3	33	9	10	11	2	5	8	24	4	1	3	3
A 111	Do you perform tasks on programmable unijunction transistors (PUT)	23	25	9	42	14	12	13	6	13	21	32	5	2	3	3
A 112	Do you perform tasks on silicon controlled switches (SCS)	11	8	3	25	8	10	7	3	5	8	21	4	1	2	2
A 113	Do you perform tasks on silicon unilateral switches (SUS)	9	14	2	31	9	11	14	3	6	10	12	2	2	2	2
A 114	Do you perform tasks on step recovery diodes (SRD)	25	28	13	44	15	23	23	9	21	28	35	5	2	2	2
A 115	Do you perform tasks on field effect diodes (FED)	7	12	3	29	8	9	15	4	7	15	15	2	0	2	2
A 116	Do you perform tasks on DIAC (Bi-directional trigger diode)	52	45	18	71	27	24	22	19	27	38	21	5	1	3	3
A 117	Do you perform tasks on varistors	12	15	5	31	8	9	7	2	5	10	12	2	0	2	2
A 118	Do you perform tasks on metal oxide varistors (MOV)	16	29	16	60	11	30	26	8	24	41	29	3	1	2	2
A 119	Do you perform tasks on schottky diodes															

0006	I 4. A4 Tubes															
A 120	Do you trace block diagrams of circuits containing electron tubes	55	26	9	84	28	25	40	22	38	72	26	8	2	7	7
A 121	Do you trace schematic diagrams of electron tube circuits	54	24	9	83	26	21	34	14	35	65	26	4	1	2	2
A 122	Do you troubleshoot circuits to isolate a faulty electron tube	55	25	9	83	25	24	36	19	34	68	29	2	2	3	3
A 123	Do you use electron tube characteristic curves	6	6	2	25	4	4	7	2	4	17	6	1	0	0	0
A 124	Do you use electron tube substitution manuals or charts	39	8	2	64	8	4	7	2	7	14	6	1	0	0	0
A 125	Do you perform tasks on diode tubes	19	4	4	68	15	6	10	5	11	22	6	2	0	2	2
A 126	Do you perform tasks on triode tubes	23	3	4	69	10	4	13	2	5	24	9	0	1	1	1
A 127	Do you perform tasks on tetrode tubes	21	4	2	59	6	4	4	1	5	21	6	1	1	1	1
A 128	Do you perform tasks on pentode tubes	22	2	2	61	7	4	5	1	5	18	6	2	1	0	0
A 129	Do you perform tasks on beam power tubes	13	13	0	33	6	5	15	4	4	17	6	2	0	0	0
A 130	Do you perform tasks on gas tubes	10	4	3	56	10	6	3	2	8	16	6	1	0	0	0
A 131	Do you perform tasks on phantastrons	2	1	0	18	4	4	2	2	2	3	6	1	0	0	0
A 132	Do you perform tasks on neon tubes	7	8	3	46	12	2	2	2	5	9	0	1	0	2	2
A 133	Do you perform tasks on xenon tubes	4	2	2	24	14	1	2	1	4	7	0	0	0	0	0
A 134	Do you perform tasks on nixie tubes	6	22	9	75	8	13	7	1	48	32	0	2	1	1	1
A 135	Do you trace block diagrams of circuits containing cathode ray tubes (CRT)	80	52	13	80	37	65	41	56	39	50	56	45	11	28	28
A 136	Do you trace schematic diagrams of CRT circuits	79	45	12	77	37	52	33	47	35	44	56	33	5	8	8

[illegible]

0007 I 5. A5 Soldering or Solderless Connections

A 141	A5-1 Do you solder or desolder hardware connections	91	84	89	99	97	99	96	97	98	98	85	84	76	61
A 142	A5-2 Do you solder or desolder component connections such as resistors, capacitors, diodes, transformers, etc	91	83	84	98	96	93	93	81	97	95	85	13	20	12
A 143	A5-3 Do you solder or desolder printed circuit board connections	86	77	71	95	77	78	73	66	86	85	59	11	5	5
A 144	A5-4 Do you solder or desolder multi-layer circuit board connections	53	46	37	70	38	33	33	27	39	39	32	10	5	4
A 145	A5-5 Do you perform high reliability soldering	73	70	61	85	70	86	85	71	84	88	74	46	35	32
A 146	A5-6 Do you use crimping tool to repair or make connections	86	83	89	99	92	97	96	97	99	96	86	93	95	91
A 147	A5-7 Do you use wire wrap tool to make connections	33	67	52	38	35	83	57	55	44	49	62	38	29	28
A 148	A5-8 Do you use punch-on tool to make connections	34	29	22	28	32	39	24	21	21	28	50	30	18	15
A 149	A5-9 Do you repair or fabricate connectors or cables on multiconductor cables	80	60	81	63	37	77	70	80	69	62	85	62	62	57
A 150	A5-10 Do you repair or fabricate connectors or cables on coaxial cables	91	82	99	82	49	99	96	94	95	96	83	98	44	92
A 151	A5-11 Do you repair or fabricate connectors or cables on triaxial cables	31	28	35	44	16	91	65	64	25	40	68	98	38	68
A 152	A5-12 Do you repair or fabricate connectors or cables on ribbon cables	38	45	56	51	27	25	46	52	30	46	71	12	6	7

0008 II. Test Equipment

0009 II 1. BI Multimeters

B 153	B1-1	Do you use the multimeter to measure DC voltage values	93	92	92	99	98	99	99	97	99	99	91	95	96	89
B 154	B1-2	Do you use the multimeter to measure AC voltage values	92	90	91	99	99	96	98	95	100	96	91	90	95	83
B 155	B1-3	Do you use the multimeter to extend the range of voltmeters using external shunts	27	25	22	78	21	35	23	18	25	42	44	18	11	11
B 156	B1-4	Do you use the multimeter to measure DC current values	72	77	78	96	81	76	68	73	77	75	71	63	54	59
B 157	B1-5	Do you use the multimeter to measure AC current values	64	66	67	92	82	74	66	70	77	71	71	62	52	54
B 158	B1-6	Do you use the multimeter to extend the range of ammeters using external shunts	19	17	20	74	18	26	16	13	16	29	44	13	9	10
B 159	B1-7	Do you use the multimeter to measure circuit resistance	79	80	75	92	88	89	85	83	90	87	79	78	90	78
B 160	B1-8	Do you use the multimeter to measure component resistance	90	87	82	98	91	93	93	88	96	92	88	57	84	64

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Task Title

304 309 316 324 404 451 451 451 451 451 451 452 452 452
55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0010 II 2. B2 Oscilloscopes

B 161	B2-1 Do you use the oscilloscope to measure time to determine frequency	84	84	68	94	12	89	85	78	95	97	85	3	1	3
B 162	B2-2 Do you use the oscilloscope to measure time (rise, fall, pulse width, etc)	85	87	64	95	14	90	98	81	95	98	82	3	1	3
B 163	B2-3 Do you use the oscilloscope to measure AC voltage	80	82	68	94	17	96	98	78	98	96	79	3	2	1
B 164	B2-4 Do you use the oscilloscope to measure DC voltage	88	88	78	92	17	96	98	78	98	97	79	2	2	1
B 165	B2-5 Do you use the oscilloscope to measure ripple voltages	67	77	37	91	9	56	74	46	76	89	65	2	0	0
B 166	B2-6 Do you use the oscilloscope to measure phase jitters	38	50	21	73	1	48	68	25	51	47	56	2	1	0
B 167	B2-7 Do you use the oscilloscope to observe signal/data patterns	78	83	63	81	10	84	76	52	68	73	62	2	1	1
B 168	B2-8 Do you use the oscilloscope to observe lissajous patterns	18	22	8	50	1	17	10	14	17	13	32	2	0	0
B 169	B2-9 Do you use the oscilloscope to observe phase relationships	73	78	54	84	12	89	88	59	88	81	79	2	1	2
B 170	B2-10 Do you use attenuator probes with oscilloscopes	71	72	51	94	8	86	83	67	82	85	65	2	2	3
B 171	B2-11 Do you use delay time multipliers with oscilloscopes	30	35	22	81	7	71	76	37	43	49	50	1	0	2

0011 II 3. B3 Signal (Function) Generators

B 172	B3-1 Do you use signal generators (SG) to perform operational checks	83	79	62	93	4	72	83	2	63	90	74	11	2	7
B 173	B3-2 Do you use SG to perform alignments, adjustments, or calibrations	82	79	54	95	4	51	60	72	58	88	71	4	4	2
B 174	B3-3 Do you use SG to troubleshoot circuits	76	75	49	84	3	44	57	58	53	77	71	10	4	4
B 175	B3-4 Do you use audio sine-wave signal generators	62	31	37	88	3	30	46	46	21	48	44	1	1	2
B 176	B3-5 Do you use audio non-sinusoidal signal generators	17	21	21	74	1	22	22	16	13	16	38	1	0	1
B 177	B3-6 Do you use RF less than 1,000MH signal generators	27	56	35	85	3	41	47	59	21	58	59	10	2	7
B 178	B3-7 Do you use RF greater than 1,000MH signal generators	15	54	31	79	2	35	48	47	26	66	53	7	1	3
B 179	B3-8 Do you use white noise signal generators	12	13	8	24	1	4	6	5	2	14	29	1	0	3
B 180	B3-9 Do you use pattern signal generators	60	26	16	30	3	9	16	5	8	15	38	1	0	1
B 181	B3-10 Do you use pseudo-random signal generators	2	30	11	18	0	6	7	5	4	3	35	2	0	1
B 182	B3-11 Do you use time mark signal generators	10	21	8	89	2	11	16	8	5	14	32	1	0	1
B 183	B3-12 Do you use multi-function (square/sine/triangular) signal generators	30	66	55	92	4	57	71	30	51	53	56	2	0	0
B 184	B3-13 Do you use TV signal generators	81	3	7	20	0	9	4	13	?	5	15	1	0	0

0012 II 4. B4 Test Equipment Types

B 185	B4-1 Do you use frequency counters	74	87	70	97	12	99	100	89	85	96	71	10	1	7
B 186	B4-2 Do you use spectrum analyzers	36	75	52	85	4	94	99	61	63	87	68	9	1	4

D	T	Task Title	304	309	316	324	404	451	451	451	451	451	451	452	452	452
I	Y	Nbr.	55	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B	51C
B	187	B4-3 Do you use field strength testers	22	8	8	24	3	8	9	5	5	6	15	19	2	5
B	188	B4-4 Do you use digital multimeters	91	91	89	99	70	99	99	94	96	99	91	82	83	83
B	189	B4-5 Do you use digital logic probes	40	61	35	77	13	45	25	24	28	22	50	6	1	2
B	190	B4-6 Do you use capacitance testers	77	57	31	80	10	13	13	8	26	45	29	6	12	2
B	191	B4-7 Do you use capacitor substitution boxes	15	3	11	59	4	5	7	3	8	8	21	6	7	2
B	192	B4-8 Do you use DC restorers (CRT rejuvenators)	64	3	3	18	3	7	5	2	2	3	24	6	0	2
B	193	B4-9 Do you use logic current tracers	17	26	16	66	6	9	13	5	8	7	21	5	0	2
B	194	B4-10 Do you use tube testers	50	3	3	56	9	5	9	1	4	15	15	4	0	2
B	195	B4-11 Do you use logic pulsers	24	36	18	74	5	13	12	5	7	5	24	5	0	2
B	196	B4-12 Do you use logic analyzers	16	49	29	60	4	13	15	8	9	14	41	6	1	2
B	197	B4-13 Do you use signature analyzers	8	14	11	59	3	11	9	5	8	6	26	5	0	2
B	198	B4-14 Do you use reflectometers	5	18	14	40	2	67	31	11	21	7	35	50	26	61

00013 III. Amplifier Circuits

00014 III 1. Cl Transistor Amplifier Circuits

C-199	C1-1	Do you trace block diagrams of circuits containing transistor amplifiers	85	81	41	90	26	72	64	53	69	86	71	21	18	27
C-200	C1-2	Do you trace schematic diagrams of transistor amplifier circuits	85	77	40	90	26	65	56	42	68	86	65	13	13	16
C-201	C1-3	Do you troubleshoot to isolate a faulty transistor amplifier	85	72	37	89	22	49	47	28	64	79	47	2	4	7
C-202	C1-4	Do you troubleshoot transistor amplifiers to circuit level components	83	68	31	86	16	35	32	15	50	65	38	2	1	3
C-203	C1-5	Do you troubleshoot transistor amplifier distortion	61	50	15	69	5	21	20	10	29	44	32	2	0	2
C-204	C1-6	Do you adjust or align transistor amplifiers	67	60	21	79	6	28	32	18	35	61	44	1	1	2
C-205	C1-7	Do you measure transistor amplifier voltage, current, or power gain	70	62	29	80	11	35	35	21	41	58	44	2	1	3
C-206	C1-8	Do you calculate values of transistor amplifier voltage, current or power gain	33	37	18	59	6	18	20	7	17	28	26	1	0	2
C-207	C1-9	Do you work on compound-connected (Darlington Pair) transistor amplifiers	56	50	13	76	10	16	12	11	21	30	29	2	0	1
C-208	C1-10	Do you work on cascade-connected transistor amplifiers	38	37	12	72	10	23	22	10	25	45	38	2	0	1
C-209	C1-11	Do you work on paraphase transistor amplifiers	15	16	2	49	4	9	7	4	5	8	32	1	0	2
C-210	C1-12	Do you work on push-pull transistor amplifiers	69	50	22	83	12	33	28	16	38	56	38	2	0	5
C-211	C1-13	Do you work on audio transistor amplifiers	74	32	20	72	20	31	30	27	21	51	47	4	1	12
C-212	C1-14	Do you work on wideband transistor amplifiers	38	53	26	77	3	37	32	30	16	51	47	2	1	12
C-213	C1-15	Do you work on IF transistor amplifiers	67	64	20	73	9	49	45	34	39	77	56	8	1	12
C-214	C1-16	Do you work on RF transistor amplifiers	63	66	21	78	7	50	57	38	42	82	56	11	2	14
C-215	C1-17	Do you work on buffer transistor amplifiers	53	53	22	74	5	53	26	19	38	49	41	5	5	3
C-216	C1-18	Do you work on complementary symmetry transistor amplifiers	50	16	4	53	6	11	8	5	13	23	29	1	0	1
C-217	C1-19	Do you work on DC transistor amplifiers (switching applications)	65	51	30	72	16	43	34	23	49	58	41	2	7	7

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Task Title

304 309 316 324 404 451 451 451 451 451 451 452 452 452
55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0015 III 2. C2 Transistor Amplifier Stabilization Circuits

C 218	C2-1 Do you trace schematic diagrams of amplifier stabilization circuits	63	49	14	65	11	30	29	19	29	38	41	2	7	4
C 219	C2-2 Do you troubleshoot amplifier stabilization circuits to circuit level components	62	47	13	63	9	18	20	9	24	38	35	2	2	1
C 220	C2-3 Do you perform tasks on emitter (swamping) resistor stabilization amplifiers	64	44	9	61	11	24	27	15	26	40	35	1	2	2
C 221	C2-4 Do you perform tasks on self-bias stabilization amplifiers	41	34	8	60	7	18	20	11	21	26	38	2	2	3
C 222	C2-5 Do you perform tasks on thermistor stabilization amplifiers	54	34	7	61	12	27	30	15	29	34	38	2	9	3
C 223	C2-6 Do you perform tasks on diode stabilization amplifiers	65	46	15	68	15	30	29	18	33	42	35	2	5	3
C 224	C2-7 Do you perform tasks on double diode stabilization amplifiers	48	24	5	51	6	21	18	11	22	29	35	1	1	2

0016 III 3. C3 Coupling Circuits

C 225	C3-1 Do you trace block diagrams of circuits containing coupling circuits	72	68	26	75	11	42	38	32	35	50	53	14	5	8
C 226	C3-2 Do you trace schematic diagrams of coupling circuits	70	67	24	75	11	36	35	25	32	47	50	8	4	2
C 227	C3-3 Do you troubleshoot circuits to isolate a faulty coupling circuit	68	62	19	73	11	24	26	15	30	46	44	4	0	1
C 228	C3-4 Do you troubleshoot coupling circuits to circuit level components	66	57	16	72	10	17	17	7	26	38	29	4	1	1
C 229	C3-5 Do you perform tasks on direct coupling circuits	68	62	18	71	9	28	30	18	31	47	47	3	4	1
C 230	C3-6 Do you perform tasks on capacitive-resistive coupling circuits	64	54	16	71	10	23	22	13	26	40	38	4	4	0
C 231	C3-7 Do you perform tasks on capacitive-inductive coupling circuits	60	52	12	67	9	21	18	13	23	37	38	2	1	0
C 232	C3-8 Do you perform tasks on transformer coupling circuits	64	56	20	67	10	21	21	18	26	35	44	4	1	1
C 233	C3-9 Do you perform tasks on optical coupling circuits	20	20	9	29	4	6	7	6	6	7	15	1	0	0

0017 III 4. C4 Electron Tube Amplifier Circuits

C 234	C4-1 Do you trace block diagrams of circuits containing electron tube amplifiers	28	15	3	69	6	16	34	13	13	55	9	6	1	5
C 235	C4-2 Do you trace schematic diagrams of electron tube amplifiers	28	15	3	69	7	11	28	8	11	52	6	2	1	2
C 236	C4-3 Do you troubleshoot to isolate a faulty electron tube amplifier	28	13	3	68	4	9	29	6	11	55	9	0	0	0

PRTHOD	Task Title	304	309	316	324	404	451	451	451	451	451	451	452	452	452
D															
T															
Y															
Nbr															
C 237	C4-4 Do you troubleshoot electron tube amplifiers to circuit level components	25	10	2	66	4	4	11	2	7	36	6	0	0	0
C 238	C4-5 Do you troubleshoot electron tube amplifier distortion	20	9	1	52	3	7	12	2	4	34	6	0	0	0
C 239	C4-6 Do you adjust or align electron tube amplifiers	24	14	2	63	2	8	21	6	8	50	6	0	0	0
C 240	C4-7 Do you measure electron tube amplifier voltage, current, or power gain	24	13	1	57	3	6	26	5	5	44	6	0	0	0
C 241	C4-8 Do you calculate values of electron tube amplifier voltage, current, or power gain	9	7	0	39	3	2	19	3	3	25	3	0	0	0
C 242	C4-9 Do you perform tasks on paraphase electron tube amplifiers	6	1	1	40	0	2	3	0	3	5	6	0	0	0
C 243	C4-10 Do you perform tasks on push-pull electron tube amplifiers	14	3	0	58	3	3	5	0	4	20	6	0	0	0
C 244	C4-11 Do you perform tasks on audio electron tube amplifiers	12	2	1	55	2	1	4	2	2	16	6	0	0	1
C 245	C4-12 Do you perform tasks on voltage regulator electron tube amplifiers	20	6	2	65	2	6	8	3	7	24	6	0	1	0
C 246	C4-13 Do you perform tasks on common grid electron tube amplifiers	20	4	2	62	1	4	16	4	6	29	6	0	0	0
C 247	C4-14 Do you perform tasks on common cathode electron tube amplifiers	17	5	2	62	2	7	15	4	7	32	6	1	1	0
C 248	C4-15 Do you perform tasks on cathode follower electron tube amplifiers	17	4	2	62	0	4	10	2	5	18	6	0	0	0

0018 III 5. C5 Operational Amplifiers

C 249	C5-1 Do you trace block or schematic diagrams of circuits containing operational amplifiers (op amps)	73	77	47	88	20	70	51	48	72	74	38	16	9	14
C 250	C5-2 Do you troubleshoot to isolate a faulty op amp circuit	71	70	41	87	18	48	40	29	63	68	29	2	4	2
C 251	C5-3 Do you calculate op amp gain	29	34	20	61	5	21	11	10	17	23	15	0	0	0
C 252	C5-4 Do you adjust op amp bias, offsets, or drift	52	64	33	80	7	28	17	15	31	47	29	0	0	0
C 253	C5-5 Do you use or apply operational amplifiers for general purpose (inverting or non-inverting)	63	68	40	79	11	47	35	33	56	64	29	2	2	3
C 254	C5-6 Do you use or apply operational amplifiers as differential/comparators	56	63	31	78	8	49	31	28	42	57	26	3	2	4
C 255	C5-7 Do you use or apply operational amplifiers for summing	37	55	23	68	6	38	21	27	38	56	24	4	2	7
C 256	C5-8 Do you use or apply operational amplifiers for unity gain amplifier (buffer)	48	53	27	74	5	38	21	19	29	38	24	4	2	3
C 257	C5-9 Do you use or apply operational amplifiers as active filters	29	43	24	52	4	32	20	15	24	25	18	1	0	1
C 258	C5-10 Do you use or apply operational amplifiers as oscillators	50	51	23	70	9	41	34	23	42	53	24	6	2	10
C 259	C5-11 Do you use or apply operational amplifiers as integrators	43	44	12	61	6	37	20	18	31	33	24	1	1	3
C 260	C5-12 Do you use or apply operational amplifiers for differentiators	47	50	18	59	7	31	16	16	28	38	24	1	1	0
C 261	C5-13 Do you use or apply operational amplifiers for power supplies (voltage regulators)	62	64	33	78	13	45	40	35	57	62	29	10	1	12

D T Y	Task Title	354	309	316	324	404	451	451	451	451	451	451	452	452	452
Nbr		55	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B	51C
C 262	C5-14 Do you use or apply operational amplifiers as analog/digital (A/D) digital/analog (D/A) converters	38	64	30	74	10	57	43	37	54	59	32	13	2	10
C 263	C5-15 Do you use or apply operational amplifiers as multivibrators	47	44	14	70	13	43	35	17	34	47	29	5	4	10
C 264	C5-16 Do you use or apply operational amplifiers as modulators/demodulators	44	58	18	67	4	31	29	22	30	42	21	5	1	8

0019 III 6. C6 Magnetic Amplifiers

C 265	C6-1 Do you trace block diagrams of circuits containing magnetic amplifiers	5	6	5	8	3	10	13	4	5	2	12	4	2	2
C 266	C6-2 Do you trace schematic diagrams of magnetic amplifier circuits	5	6	4	8	3	9	10	3	5	1	9	2	1	0
C 267	C6-3 Do you troubleshoot to isolate a faulty magnetic amplifier	5	4	3	7	4	6	10	3	3	1	6	0	2	0
C 268	C6-4 Do you troubleshoot magnetic amplifiers to circuit level components	5	3	1	8	3	4	3	2	2	2	9	0	1	0
C 269	C6-5 Do you adjust magnetic amplifiers or components	5	3	1	8	3	4	3	2	4	2	6	0	1	0
C 270	C6-6 Do you trace block diagrams of circuits containing saturable reactors	1	2	0	5	0	5	5	2	4	3	6	3	0	0
C 271	C6-7 Do you trace schematic diagrams of saturable reactor circuits	1	2	0	5	0	5	5	2	3	3	6	1	0	0
C 272	C6-8 Do you troubleshoot to isolate a faulty saturable reactor	1	1	0	5	0	4	4	2	4	3	6	0	0	0
C 273	C6-9 Do you troubleshoot saturable reactors to circuit level components	1	1	0	5	0	3	2	1	4	3	6	0	0	0
C 274	C6-10 Do you adjust saturable reactor circuits or components	1	1	0	4	0	4	2	1	4	3	6	0	0	0

0020 IV. Power Supplies

0021 IV 1. D1 Power Supply Circuits

D 275	D1-1 Do you trace block diagrams of circuits containing power supplies	86	89	63	93	75	94	91	82	93	95	76	61	51	58
D 276	D1-2 Do you trace schematic diagrams of power supply circuits	86	84	57	94	72	89	84	71	94	90	71	42	44	25
D 277	D1-3 Do you troubleshoot circuits to isolate a faulty power supply	87	85	59	93	73	89	88	80	96	94	79	39	37	36
D 278	D1-4 Do you troubleshoot power supplies to circuit level components	85	70	41	92	55	48	45	34	67	71	44	7	10	7
D 279	D1-5 Do you align or adjust power supplies	85	85	56	94	54	82	88	76	93	94	68	3	2	3
D 280	D1-6 Do you perform tasks on half-wave rectifier power supplies	68	50	27	89	35	42	41	28	51	59	56	6	9	9

D Y	Tsk Nbr	Task Title	304	309	316	324	404	451	451	451	451	451	451	451	452	452	452
D	281	DI-7 Do you perform tasks on full-wave rectifier power supplies	75	55	32	90	41	44	46	31	57	68	56	7	7	9	
D	282	DI-8 Do you perform tasks on full-wave bridge rectifier power supplies	81	59	35	89	43	45	46	30	55	71	53	6	12	11	
D	283	DI-9 Do you perform tasks on three-phase rectifier power supplies	16	34	13	47	15	30	34	25	30	41	44	6	2	7	
D	284	DI-10 Do you perform tasks on voltage multipliers (doublers/triplers)	65	38	20	77	18	33	32	26	34	44	35	8	1	4	
D	285	DI-11 Do you perform tasks on DC to DC converters	55	41	32	73	20	47	48	26	45	51	32	10	4	5	
D	286	DI-12 Do you perform tasks on inverters (DC to AC converters)	37	32	22	73	25	46	47	33	56	47	47	8	6	7	
D	287	DI-13 Do you perform tasks on switching power supplies	47	44	25	62	27	26	18	14	22	23	15	7	5	8	

0022 IV 2. D2 Power Supply Filters

D 288	D2-1 Do you trace block diagrams of circuits containing power supply filters	68	65	28	80	19	68	61	45	57	65	56	12	7	21
D 289	D2-2 Do you trace schematic diagrams of power supply filters	68	63	27	79	20	57	54	34	55	60	50	8	4	7
D 290	D2-3 Do you troubleshoot circuits to isolate a faulty power supply filter	66	58	23	78	18	54	48	26	52	59	50	2	2	11
D 291	D2-4 Do you troubleshoot power supply filters to circuit level components	63	55	20	75	16	30	20	12	34	47	32	2	0	3
D 292	D2-5 Do you perform tasks on capacitive power supply filters	65	58	25	78	21	43	43	23	38	56	38	3	2	4
D 293	D2-6 Do you perform tasks on inductive power supply filters	50	48	17	69	16	38	36	19	32	52	38	2	2	4
D 294	D2-7 Do you perform tasks on L-type power supply filters	28	39	9	46	8	29	25	12	22	35	38	2	0	1
D 295	D2-8 Do you perform tasks on P-type power supply filters	29	36	11	40	8	23	18	10	15	35	29	3	1	1
D 296	D2-9 Do you perform tasks on T-type power supply filters	20	28	8	39	4	20	13	8	13	27	26	2	0	0
D 297	D2-10 Do you perform tasks on resistive capacitive (RC) power supply filters	59	56	23	77	18	38	40	23	36	53	38	4	4	3
D 298	D2-11 Do you perform tasks on inductive capacitive (LC) power supply filters	54	51	14	70	16	36	38	19	29	49	38	3	4	3

0023 IV 3. D3 Power Supply Voltage Regulators

D 299	D3-1 Do you trace block diagrams of circuits containing power supply voltage regulators	78	75	40	91	32	74	68	69	71	74	68	20	16	17
D 300	D3-2 Do you trace schematic diagrams of power supply voltage regulator circuits	77	72	40	90	32	64	59	55	73	74	62	9	10	5
D 301	D3-3 Do you troubleshoot circuits to isolate a faulty power supply voltage regulator	78	68	37	90	31	60	54	58	68	74	68	3	6	4
D 302	D3-4 Do you troubleshoot power supply voltage regulators to circuit level components	75	60	30	86	24	28	24	13	49	60	35	1	1	2
D 303	D3-5 Do you perform tasks on variable resistor power supply voltage regulators	72	59	27	84	29	50	52	35	60	67	47	2	7	4

D T Y	Task Nbr	Task Title	304	309	316	324	404	451	451	451	451	451	451	451	452	452	452	452
D	304	D3-6 Do you perform tasks on zener diode power supply voltage regulators	55	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B	51C	51C	51C
D	305	D3-7 Do you perform tasks on transistor series power supply voltage regulators	67	63	27	87	23	48	48	26	54	63	50	3	7	4		
D	306	D3-8 Do you perform tasks on IC power supply voltage regulators	67	53	23	84	19	35	32	27	45	51	41	2	2	4		
D	307	D3-9 Do you perform tasks on pulse width modulator power supply voltage regulators	58	51	25	75	13	28	26	19	27	43	24	2	0	2		
D	308	D3-10 Do you perform tasks on transistor series power supply voltage regulators with current limiting	25	25	6	45	4	22	19	15	21	32	38	3	2	4		
D	309	D3-11 Do you perform tasks on crow bar power supply voltage regulators	43	43	13	71	11	30	23	14	25	40	32	2	0	1		
			11	45	9	61	4	38	30	12	19	25	38	4	0	3		

V. Reactive Circuits

00025 V 1. El Resistive Capacitive Inductive Circuits

E 310	E1-1 Do you trace schematic or block diagrams of circuits containing resistive capacitive inductive (RCL) circuits	59	64	19	73	13	43	35	24	32	47	41	16	13	7
E 311	E1-2 Do you troubleshoot RCL circuits to circuit level components	57	57	15	71	11	21	21	10	27	41	26	2	9	1
E 312	E1-3 Do you trace schematic or block diagrams of circuits containing resonant RCL circuits	53	56	15	68	11	35	32	19	24	42	32	11	9	5
E 313	E1-4 Do you troubleshoot resonant RCL circuits to circuit level components	50	50	12	65	9	15	20	7	18	36	15	1	6	1
E 314	E1-5 Do you calculate values of impedance, voltage, or current in RCL circuits	15	17	8	44	4	11	10	6	13	14	9	2	2	1
E 315	E1-6 Do you calculate phase angle of RCL circuits	10	12	4	31	2	6	7	4	9	12	9	1	1	1
E 316	E1-7 Do you calculate values of power in RCL circuits	10	14	5	36	3	6	9	5	9	12	9	1	1	1

00026 V 2. E2 Frequency Sensitive Filters

E 317	E2-1 Do you trace schematic or block diagrams of circuits containing frequency sensitive filters	46	60	22	70	7	31	37	34	20	65	47	14	5	22
E 318	E2-2 Do you troubleshoot circuits to isolate a faulty frequency sensitive filter	44	53	19	68	6	23	29	27	20	64	44	3	1	8
E 319	E2-3 Do you troubleshoot frequency sensitive filters to circuit level components	42	47	13	64	4	11	13	13	15	40	18	1	0	4
E 320	E2-4 Do you align or adjust frequency sensitive filters	42	45	16	67	5	19	19	18	15	36	21	1	1	3
E 321	E2-5 Do you calculate capacitance or inductance values for specific frequency sensitive filters	13	15	6	39	2	6	5	5	5	12	12	1	0	3
E 322	E2-6 Do you perform tasks on low pass frequency sensitive filters	48	50	23	72	4	32	32	29	18	51	35	5	1	11

D	T	Task	Y	Nbr	Task Title	304	309	316	324	404	451	451	451	451	451	451	452	452	452
						55	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B	51C
E	323	E2-7 Do you perform tasks on high pass frequency sensitive filters				48	48	22	72	3	31	31	30	17	49	35	4	1	7
E	324	E2-8 Do you perform tasks on band pass frequency sensitive filters				49	57	27	72	3	30	34	31	16	77	35	4	1	8
E	325	E2-9 Do you perform tasks on band-reject frequency sensitive filters				34	43	14	64	2	15	15	18	10	35	32	2	0	2
E	326	E2-10 Do you perform tasks on ferrite bead frequency sensitive filters				29	14	2	37	1	7	11	5	5	14	26	2	0	2

0027 VI. Waveshaping/Generating Circuits

0028 VI 1. FI Oscillators

F 327	F1-1 Do you trace block diagrams of circuits containing oscillators	73	76	36	84	15	58	63	45	51	82	50	34	10	36
F 328	F1-2 Do you trace schematic diagrams of oscillator circuits	74	71	32	84	14	49	55	34	48	77	41	21	6	12
F 329	F1-3 Do you troubleshoot to isolate a faulty oscillator circuit	73	68	27	83	11	45	51	32	48	75	41	15	4	7
F 330	F1-4 Do you troubleshoot oscillators to circuit level components	70	59	21	80	6	21	26	11	32	49	26	3	0	0
F 331	F1-5 Do you align or adjust oscillator circuits	72	64	28	84	7	35	40	30	39	71	41	2	0	0
F 332	F1-6 Do the oscillators you work with use LC tank circuits	60	50	17	77	10	29	37	18	35	49	35	3	2	1
F 333	F1-7 Do the oscillators you work with use RC networks	60	49	21	81	7	30	35	20	32	53	32	8	2	1
F 334	F1-8 Do the oscillators you work with use crystals	66	72	33	81	5	35	45	35	36	61	35	10	1	4
F 335	F1-9 Do the oscillators you work with use phase lock loops (PLL)	41	64	25	63	2	19	38	33	10	49	32	10	1	4
F 336	F1-10 Do you perform tasks on series Hartley oscillator circuits	36	26	5	58	3	12	10	6	12	20	24	1	0	0
F 337	F1-11 Do you perform tasks on shunt Hartley oscillator circuits	35	25	6	53	4	13	10	6	14	21	24	2	0	0
F 338	F1-12 Do you perform tasks on Colpitts oscillator circuits	34	26	5	61	4	9	12	4	8	26	24	2	0	0
F 339	F1-13 Do you perform tasks on Clapp oscillator circuits	9	13	0	33	2	6	7	4	6	9	12	1	0	0
F 340	F1-14 Do you perform tasks on voltage control oscillators (VCO/VTD)	49	53	29	75	4	23	40	26	14	64	35	6	2	1
F 341	F1-15 Do you perform tasks on crystal oscillator circuits	62	61	24	78	4	28	30	24	27	51	32	6	0	2
F 342	F1-16 Do you perform tasks on Wien bridge oscillator circuits	20	16	4	73	1	9	9	3	10	21	24	1	1	0
F 343	F1-17 Do you perform tasks on pulse generating oscillator circuits	41	30	10	62	5	23	25	16	20	36	35	8	2	3
F 344	F1-18 Do you perform tasks on blocked/blocking oscillator circuits	30	13	1	36	2	9	7	3	7	10	26	0	0	0
F 345	F1-19 Do you perform tasks on burst generators	48	6	1	39	1	6	8	4	11	13	26	2	0	1
F 346	F1-20 Do you perform tasks on RC phase shift oscillators	30	22	6	51	3	20	21	10	15	31	29	5	2	1

D	T	Y	Task	Nbr
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304 309 316 324 404 451 451 451 451 451 452 452 452

0031 VI 4. F4 Limiter/Clamper Circuits

F 373	F4-1 Do you trace block diagrams of circuits containing limiters	62	53	8	71	8	53	35	28	35	51	44	8	5	2
F 374	F4-2 Do you trace schematic diagrams of limiter circuits	63	50	8	69	8	45	30	19	37	48	35	5	4	0
F 375	F4-3 Do you trace block diagrams of circuits containing clampers	62	49	6	68	8	43	23	20	35	47	38	2	1	0
F 376	F4-4 Do you trace schematic diagrams of clamper circuits	64	46	6	67	6	40	22	16	35	44	35	2	0	0
F 377	F4-5 Do you troubleshoot to isolate a faulty limiter circuit	60	43	7	67	5	33	20	13	33	45	32	1	2	0
F 378	F4-6 Do you troubleshoot limiters to circuit level components	58	40	5	66	4	13	10	6	26	38	15	1	1	0
F 379	F4-7 Do you troubleshoot to isolate a faulty clamper circuit	62	41	4	65	5	28	14	9	30	40	26	1	0	0
F 380	F4-8 Do you troubleshoot clampers to circuit level components	60	39	3	64	3	12	9	5	24	36	15	0	0	0
F 381	F4-9 Do you perform tasks on series diode limiter circuits	54	34	5	65	5	35	22	14	30	40	26	0	1	0
F 382	F4-10 Do you perform tasks on shunt diode limiter circuits	48	36	4	65	4	35	20	15	27	40	26	1	0	0
F 383	F4-11 Do you perform tasks on bias limiter circuits	40	30	3	55	3	30	13	11	24	33	26	0	0	0
F 384	F4-12 Do you perform tasks on zener diode circuits	62	46	9	70	7	37	28	16	35	48	35	1	2	0
F 385	F4-13 Do you perform tasks on transistor limiter circuits	57	32	6	64	5	29	19	12	26	34	26	1	1	0
F 386	F4-14 Do you perform tasks on triode limiter circuits	22	13	2	43	0	16	7	7	13	21	12	0	0	0
F 387	F4-15 Do you perform tasks on diode clamper circuits	61	43	5	63	5	33	18	15	27	42	29	0	0	0
F 388	F4-16 Do you perform tasks on bias clamper circuits	39	26	1	54	3	26	13	12	22	34	24	0	0	0

00032 VII. Computers, Digital Circuits, and Devices

00033 VII 1. GI Digital Logic Numbering Systems and Functions

G 389	G1-1 Do you convert decimal numbers to binary numbers or binary numbers to decimal	26	64	37	47	8	91	63	67	60	51	62	66	21	32
G 390	G1-2 Do you convert octal numbers to binary or binary numbers to octal	13	44	25	37	4	91	50	66	49	49	59	62	18	20
G 391	G1-3 Do you convert hexadecimal numbers to binary or binary numbers to hexadecimal	17	53	24	38	3	92	41	62	56	42	56	38	12	12
G 392	G1-4 Do you convert octal numbers to decimal or decimal numbers to octal	13	44	24	36	3	88	43	61	46	45	56	42	15	14
G 393	G1-5 Do you convert hexadecimal numbers to decimal or decimal numbers to hexadecimal	16	50	24	37	3	89	37	61	57	41	56	35	9	12
G 394	G1-6 Do you convert octal numbers to hexadecimal or hexadecimal numbers to octal	12	36	17	32	2	90	36	57	41	38	56	35	10	10
G 395	G1-7 Do you convert base number fractions to another base numbering system	11	28	11	31	3	48	23	28	30	27	29	26	7	9
G 396	G1-8 Do you add binary numbers	17	41	22	38	6	78	41	49	45	44	38	26	9	18

Task Y Nbr	Task Title	304	309	316	324	404	451	451	451	451	451	451	452	452	452	452	51A	51B	51C
D																			
G 397	G1-9 Do you subtract binary numbers	17	39	21	38	6	71	37	47	40	42	38	20	10	14				
G 398	G1-10 Do you multiply binary numbers	13	25	12	27	4	48	23	27	25	27	29	12	5	8				
G 399	G1-11 Do you divide binary numbers	13	23	11	26	3	45	22	26	23	27	26	11	5	7				
G 400	G1-12 Do you add octal numbers	10	31	14	28	3	76	29	45	30	36	29	17	6	7				
G 401	G1-13 Do you subtract octal numbers	10	30	12	28	3	70	27	42	30	36	29	16	6	5				
G 402	G1-14 Do you add hexadecimal numbers	11	32	16	27	1	65	20	38	34	30	21	14	6	4				
G 403	G1-15 Do you subtract hexadecimal numbers	10	30	14	27	1	59	20	35	35	30	21	14	6	4				
G 404	G1-16 Do you use binary coded decimal (BCD)	20	57	32	53	6	84	58	62	52	60	56	51	13	21				
G 405	G1-17 Do you use gray codes	4	7	3	14	1	7	2	8	16	9	44	5	0	1				
G 406	G1-18 Do you use ICAD codes	1	2	1	8	0	4	2	3	3	1	9	4	0	1				
G 407	G1-19 Do you use excess-3 (XS3) codes	3	2	0	8	0	4	2	6	7	2	24	5	0	1				
G 408	G1-20 Do you use parity bit codes	6	34	12	19	3	54	19	34	36	33	50	16	2	4				
G 409	G1-21 Do you use binary codes	2	2	1	7	2	5	1	4	7	2	9	7	0	1				
G 410	G1-22 Do you use ASCII codes	11	33	17	36	3	65	20	45	21	15	56	5	0	3				
G 411	G1-23 Do you use EBCDI codes	2	4	4	11	0	4	1	3	5	1	12	3	0	1				
G 412	G1-24 Do you trace data flow through logic symbol diagrams	42	76	31	68	11	86	63	55	78	75	62	57	27	33				
G 413	G1-25 Do you trace data flow through logic schematic diagrams	44	77	32	68	11	84	60	50	77	75	59	51	27	27				
G 414	G1-26 Do you troubleshoot digital systems to major units	41	78	29	64	11	76	52	56	70	71	59	51	22	23				
G 415	G1-27 Do you troubleshoot digital systems subassemblies or circuit cards	43	78	29	66	11	70	45	45	71	72	47	7	1	2				
G 416	G1-28 Do you troubleshoot digital systems, subsystems or circuit cards to circuit level components or IC logic (High = Binary 1)	42	72	26	65	7	48	31	18	55	64	41	6	1	1				
G 417	G1-29 Do you trace data flow through circuits using positive logic (High = Binary 1)	40	74	28	65	6	74	50	36	68	71	47	25	17	4				
G 418	G1-30 Do you trace data flow through circuits using negative logic (High = Binary 0)	33	53	21	60	6	65	43	33	64	66	47	22	16	13				
G 419	G1-31 Do you perform tasks related to AND gates	55	78	38	72	15	84	62	54	85	79	62	26	34	27				
G 420	G1-32 Do you perform tasks related to OR gates	54	78	38	72	15	84	62	54	84	79	62	26	34	28				
G 421	G1-33 Do you perform tasks related to inhibited gates logic functions	49	72	24	68	6	73	53	48	80	77	50	24	24	20				
G 422	G1-34 Do you perform tasks related to NAND or NOR gates	53	76	35	71	13	81	60	52	83	79	62	26	32	27				
G 423	G1-35 Do you perform tasks related to exclusive OR/NOR logic functions	50	73	30	67	9	79	52	49	76	75	62	23	12	17				
G 424	G1-36 Do you perform tasks related to RS flip flops	41	63	16	59	5	74	43	42	74	65	50	8	5	5				
G 425	G1-37 Do you perform tasks related to D(Data) flip flops	37	65	21	59	7	70	32	34	57	54	50	9	2	8				
G 426	G1-38 Do you perform tasks related to T(Toggle) flip flops	37	60	17	59	7	62	35	33	60	55	44	7	2	10				
G 427	G1-39 Do you perform tasks related to JK flip flops	45	71	24	63	5	77	48	38	77	69	50	7	0	2				
G 428	G1-40 Do you perform tasks related to Schmidt triggers	39	52	21	64	7	46	33	25	46	53	50	5	0	3				
G 429	G1-41 Do you perform tasks related to delay (One-shot) logic functions	33	53	21	58	6	43	34	33	44	54	47	8	7	7				
G 430	G1-42 Do you perform tasks related to open collector gates (wired "AND" or wired "OR")	28	55	16	47	3	40	23	19	32	43	41	7	6	3				
G 431	G1-43 Do you perform tasks related to buffers	44	68	28	66	4	65	38	35	54	64	59	10	10	8				
G 432	G1-44 Do you perform tasks related to inverters	49	72	31	68	7	67	46	38	66	71	59	10	15	11				
G 433	G1-45 Do you perform tasks related to complemented flip flops	25	36	11	43	3	37	21	20	30	34	41	6	0	3				
G 434	G1-46 Do you perform tasks related to complementing flip flops	25	36	10	43	3	36	22	20	30	34	41	5	0	3				

D
T Task
Y Nbr

Task Title

G 435	G1-47 Do you develop Boolean equations from logic circuits or diagrams	9	24	9	25	3	30	17	13	26	27	21	10	5	5
G 436	G1-48 Do you develop logic diagrams from Boolean equations	8	17	8	22	3	26	16	12	21	23	21	8	4	4
G 437	G1-49 Do you simplify Boolean expressions using Boolean algebra	9	21	8	23	3	23	18	15	21	25	21	10	5	4
G 438	G1-50 Do you perform tasks on RTL (resistor transistor logic formally DCTL)	23	36	11	45	4	30	15	16	26	33	32	3	0	3
G 439	G1-51 Do you perform tasks on DTL (diode transistor logic)	30	33	11	48	5	36	17	18	29	33	32	3	0	2
G 440	G1-52 Do you perform tasks on TTL (transistor transistor logic)	38	68	31	67	8	57	30	32	38	54	53	3	0	2
G 441	G1-53 Do you perform tasks on ECL/CHL (emitter coupled or current mode logic)	13	18	6	35	4	26	12	22	20	27	38	1	0	1
G 442	G1-54 Do you perform tasks on HTL (high threshold logic)	7	10	3	25	2	14	5	6	8	12	26	2	0	1
G 443	G1-55 Do you perform tasks on CMOS (complementary metal oxide semiconductor)	29	39	24	49	7	30	25	21	21	39	35	1	0	2
G 444	G1-56 Do you perform tasks on positive MOS ICs	14	23	4	27	2	17	11	11	13	25	26	2	0	1
G 445	G1-57 Do you perform tasks on negative MOS ICs	13	16	4	27	0	16	9	10	13	20	26	3	0	1
G 446	G1-58 Do you perform tasks on vertical MOS ICs	6	7	2	18	0	14	5	6	10	10	15	2	0	1

0034 VII 2. G2 Computers

G 447	G2-1 Do you trace block or schematic diagrams of computer controlled or computer based systems	19	61	25	35	3	82	43	75	48	46	68	62	32	32
G 448	G2-2 Do you load programs	21	58	43	42	11	85	44	82	42	42	71	60	9	27
G 449	G2-3 Do you write or debug programs	9	12	19	18	7	23	11	57	15	16	41	7	0	2
G 450	G2-4 Do you troubleshoot computers to a major unit	17	55	21	20	4	83	41	80	43	38	59	45	22	15
G 451	G2-5 Do you troubleshoot computers to a subassembly or circuit card	13	56	15	18	3	82	42	81	49	37	59	7	1	2
G 452	G2-6 Do you troubleshoot computer subassembly or circuit card to circuit level components or IC	12	41	8	14	2	38	17	20	26	18	26	5	0	1
G 453	G2-7 Do you use computer flow charts or diagrams	11	52	17	27	4	65	41	70	35	33	45	46	11	7
G 454	G2-8 Do you perform tasks on analog computers	8	21	7	19	3	57	24	27	41	32	16	33	22	21
G 455	G2-9 Do you perform tasks on digital computers	21	65	47	35	6	87	45	82	54	47	68	55	24	30
G 456	G2-10 Do you use Basic computer language	16	24	29	35	11	33	12	9	11	16	44	9	5	7
G 457	G2-11 Do you use COBOL computer language	0	2	4	4	1	3	2	2	4	1	3	2	0	4
G 458	G2-12 Do you use FORTRAN computer language	0	8	14	4	4	4	4	4	3	3	6	2	0	2
G 459	G2-13 Do you use ADA computer language	0	1	1	2	1	1	2	3	2	1	3	1	0	1
G 460	G2-14 Do you use ATLAS computer language	0	0	0	5	2	68	41	88	21	31	68	2	0	1
G 461	G2-15 Do you use ELAN computer language	0	0	0	3	1	2	34	1	2	1	3	1	0	1
G 462	G2-16 Do you use PASCAL computer language	0	1	6	4	2	4	2	6	2	6	2	0	2	2
G 463	G2-17 Do you use RPG computer language	0	0	0	2	1	1	1	3	1	1	3	1	0	2
G 464	G2-18 Do you use Machine computer language	5	19	8	16	2	36	15	16	18	7	44	3	0	3
G 465	G2-19 Do you use C computer language	1	1	5	2	2	1	1	2	2	1	3	2	0	1
G 466	G2-20 Do you perform tasks on magnetic (tape, disc, core) computer memories	25	58	43	27	7	89	45	81	42	49	71	24	9	16
G 467	G2-21 Do you perform tasks on semiconductor (RAM, ROM, EPROM, PROM) computer memories	22	55	27	29	4	70	32	68	28	44	59	21	7	15

D	T	I	Task Title	304	309	316	324	404	451	451	451	451	451	451	452	452	452
Nbr				55	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B	51C
G	495	C3-8	Do you perform tasks on modulus counters in logic circuits	10	23	2	16	1	11	7	8	12	10	12	0	0	0
G	496	C3-9	Do you perform tasks on synchronous (parallel) counters in logic circuits	17	46	14	45	4	45	29	25	33	34	38	2	1	1
G	497	C3-10	Do you perform tasks on asynchronous (serial) counters in logic circuits	18	47	13	45	4	45	28	23	33	36	38	2	1	1
G	498	C3-11	Do you trace logic diagrams of circuits containing registers	23	61	17	36	4	62	40	34	45	44	50	5	2	3
G	499	C3-12	Do you troubleshoot circuits containing registers to isolate a faulty register	22	53	16	33	3	45	34	17	44	39	41	1	0	1
G	500	C3-13	Do you troubleshoot registers to circuit level components	21	46	14	30	2	28	15	5	30	31	15	0	0	1
G	501	C3-14	Do you perform tasks on shift registers in logic circuits	22	54	19	33	2	53	33	32	46	44	44	1	1	1
G	502	C3-15	Do you perform tasks on storage registers in logic circuits	22	52	15	33	2	55	32	30	43	42	44	2	1	1
G	503	C3-16	Do you trace data flow through combinational logic circuits	26	54	16	33	1	43	29	25	35	47	50	9	1	5
G	504	C3-17	Do you troubleshoot to isolate a faulty combinational logic circuit	25	50	15	32	1	34	24	16	34	43	41	2	0	0
C	505	C3-18	Do you troubleshoot combinational logic circuits to circuit level components	24	43	11	30	0	23	10	6	27	34	15	2	0	0
G	506	C3-19	Do you perform tasks on encoders	36	55	16	36	3	45	26	23	41	53	56	5	0	5
G	507	C3-20	Do you perform tasks on decoders	35	57	15	36	4	45	26	24	43	55	56	5	0	5
G	508	C3-21	Do you perform tasks on multiplexers	26	50	18	33	1	50	27	26	40	44	53	7	1	2
G	509	C3-22	Do you perform tasks on demultiplexers	18	46	16	26	1	43	23	23	30	38	47	4	0	1
G	510	C3-23	Do you perform tasks on comparators	23	55	12	33	1	46	6	24	27	46	53	3	1	2
G	511	C3-24	Do you perform tasks on parity generators or checkers	10	34	7	20	0	43	15	16	22	27	53	2	0	2
G	512	C3-25	Do you perform tasks on code converters	9	29	8	18	0	23	11	9	17	21	32	1	0	0
G	513	C3-26	Do you perform tasks on adders	18	37	5	30	1	36	18	13	26	25	44	5	0	2
G	514	C3-27	Do you perform tasks on subtractors	13	31	5	28	1	33	16	12	24	23	44	5	0	2
G	515	C3-28	Do you perform tasks on count detect circuits	11	21	3	17	0	25	10	6	11	10	18	0	0	0

0036 VII 4. G4 Digital to Analog (D/A) and Analog to Digital (A/Converters

G 516	G4-1 Do you trace data flow through A/D converters	27	60	26	63	3	67	42	50	57	52	53	42	17	26
G 517	G4-2 Do you trace data flow through D/A converters	27	66	23	61	3	68	40	47	54	53	50	34	17	22
G 518	G4-3 Do you troubleshoot A/D converter circuits	26	55	20	61	2	52	36	48	52	48	38	18	5	9
G 519	G4-4 Do you troubleshoot D/A converter circuits	26	61	18	60	2	51	33	44	49	48	38	15	4	5
G 520	G4-5 Do the converters you perform tasks on use flash conversion	4	4	3	12	0	4	2	3	5	6	9	2	1	3
G 521	G4-6 Do the converters you perform tasks on use successive approximation conversion	7	15	5	27	1	14	4	9	10	12	18	2	0	3
G 522	G4-7 Do the converters you perform tasks on use ramp conversion	9	25	8	42	1	16	10	10	12	21	24	4	1	2
G 523	G4-8 Do the converters you perform tasks on use R2R conversion	3	7	2	16	0	6	5	5	5	6	0	1	0	2

PRTHOD

Lowry TTC AFSCs (Inventory Order - 1 of 3)

PH0027

Occupational Analysis Program
USAFOMC (ATC) Randolph AFB TX

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T Tsk
Y Nbr

Task Title

304 309 316 324 404 451 451 451 451 451 451 452 452 452
55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

VIII. Transmission/Reception Circuits, Devices, and Systems

VIII 1. H1 Connections

H 524 H1-1 Do you measure electrical length on transmission lines
H 525 H1-2 Do you measure physical length on transmission lines
H 526 H1-3 Do you measure standing wave ratio (SWR) on transmission lines
H 527 H1-4 Do you construct transmission lines
H 528 H1-5 Do you match transmission line impedance with loads
H 529 H1-6 Do you calculate the characteristic impedance (Z0) of transmission lines
H 530 H1-7 Do you troubleshoot transmission lines
H 531 H1-8 Do you perform tasks on open-wire transmission lines
H 532 H1-9 Do you perform tasks on twisted pair transmission lines
H 533 H1-10 Do you perform tasks on twin lead transmission lines
H 534 H1-11 Do you perform tasks on flexible coaxial transmission lines
H 535 H1-12 Do you perform tasks on rigid coaxial transmission lines
H 536 H1-13 Do you perform tasks on fiber-optic transmission lines
H 537 H1-14 Do you trace schematic or block diagrams of circuits containing waveguides
H 538 H1-15 Do you troubleshoot circuits to isolate a faulty waveguide assembly
H 539 H1-16 Do you pressurize or purge waveguide assemblies
H 540 H1-17 Do you measure standing wave ratio for waveguide assemblies
H 541 H1-18 Do you remove or install waveguide or associated coupling hardware components

VIII 2. H2 Microwave Oscillators and Amplifiers

H 542 H2-1 Do you trace schematic or block diagrams of circuits containing microwave oscillators or amplifiers
H 543 H2-2 Do you troubleshoot circuits to isolate a faulty microwave oscillator or amplifier
H 544 H2-3 Do you tune or adjust microwave oscillators or amplifiers
H 545 H2-4 Do you perform tasks on two-cavity klystron microwave oscillators and amplifiers

D T Y	Task Title	304	309	316	324	404	451	451	451	451	451	451	452	452	452	51C
H 546	H2-5 Do you perform tasks on three-cavity klystron microwave oscillators and amplifiers	0	10	0	28	0	1	4	1	7	3	0	3	0	0	
H 547	H2-6 Do you perform tasks on reflex klystron microwave oscillators and amplifiers	0	3	0	44	0	6	6	2	24	7	9	4	0	0	
H 548	H2-7 Do you perform tasks on traveling wave tube microwave oscillators and amplifiers	0	15	2	44	0	27	54	27	26	45	38	19	4	2	
H 549	H2-8 Do you perform tasks on magnetron microwave oscillators and amplifiers	0	2	0	28	0	9	20	9	35	5	29	11	2	2	
H 550	H2-9 Do you perform tasks on backward wave oscillator	0	0	0	36	0	5	8	2	27	37	3	2	0	0	
H 551	H2-10 Do you perform tasks on parametric amplifiers	0	3	4	13	0	23	4	2	4	6	0	7	0	0	
H 552	H2-11 Do you perform tasks on yttrium iron garnet (YIG) tuned microwave oscillators and amplifiers	0	2	1	48	1	3	34	23	12	39	29	3	2	3	

0040 VIII 3. H3 Resonant Cavities

H	Task Title	4	19	2	40	0	9	14	12	17	30	21	3	0	1
H 553	H3-1 Do you trace schematic or block diagrams of circuits containing resonant cavities	4	19	2	40	0	9	14	12	17	30	21	3	0	1
H 554	H3-2 Do you troubleshoot circuits to isolate a faulty resonant cavity	3	15	1	38	0	6	12	5	14	25	15	0	0	0
H 555	H3-3 Do you tune or adjust resonant cavities electrically	5	10	1	37	0	3	12	6	14	21	18	0	0	0
H 556	H3-4 Do you tune or adjust resonant cavities physically	3	13	3	37	0	3	14	4	15	16	15	0	0	0
H 557	H3-5 Do you measure frequency of resonant cavities	3	14	2	39	0	4	10	5	14	18	15	0	0	0
H 558	H3-6 Do you perform tasks on probe resonant cavities	3	10	1	26	0	3	4	3	6	10	3	0	1	0
H 559	H3-7 Do you perform tasks on loop resonant cavities	2	4	2	18	0	0	3	3	5	10	3	0	0	0
H 560	H3-8 Do you perform tasks on aperture (iris/window) resonant cavities	2	7	0	7	0	3	5	3	4	4	6	0	0	0

0041 VIII 4. H4 Transmitters and Receivers

H	Task Title	14	25	8	61	1	13	38	49	12	53	44	8	0	21
H 561	H4-1 Do you use "AM" modulation principles	14	25	8	61	1	13	38	49	12	53	44	8	0	21
H 562	H4-2 Do you trace block diagrams of AM transmitters	12	21	5	50	1	10	41	52	10	55	38	8	2	25
H 563	H4-3 Do you trace block diagrams of AM transmitter subassemblies or circuit cards	13	18	3	48	1	10	38	49	10	55	38	3	2	7
H 564	H4-4 Do you trace schematic diagrams of AM transmitter subassemblies or circuit cards	13	15	2	44	1	9	34	35	9	51	32	2	1	3
H 565	H4-5 Do you troubleshoot AM transmitters to major units	12	18	5	46	1	8	32	49	8	51	35	6	1	15
H 566	H4-6 Do you troubleshoot AM transmitters to subassemblies or circuit cards	12	16	3	46	1	9	34	50	8	51	38	1	1	2
H 567	H4-7 Do you troubleshoot AM transmitter subassemblies or circuit cards to circuit level components	11	14	2	44	1	6	12	14	5	39	24	1	1	1
H 568	H4-8 Do you align or adjust AM transmitters or circuits	12	15	3	52	1	6	37	51	8	52	29	2	1	3
H 569	H4-9 Do you calculate percentage of modulation for AM transmitters	8	10	5	61	1	4	26	44	4	46	18	1	1	3
H 570	H4-10 Do you use "AM" demodulation principles	16	40	10	35	0	5	19	33	4	36	35	2	0	15
H 571	H4-11 Do you trace block diagrams of AM receivers	18	42	8	33	0	9	34	48	4	45	35	6	2	32

D T Y	Task Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	452 X7	452 51A	452 51B	452 51C
H	572	H4-12 Do you trace block diagrams of AM receiver subassemblies or circuit cards	18	39	7	31	0	9	32	47	5	45	35	1	1	11
H	573	H4-13 Do you trace schematic diagrams of AM receiver subassemblies or circuit cards	19	56	6	30	0	0	29	36	4	45	32	0	1	4
H	574	H4-14 Do you troubleshoot AM receivers to major units	19	38	7	29	0	6	30	46	4	44	32	2	1	16
H	575	H4-15 Do you troubleshoot AM receivers to subassemblies or circuit cards	19	34	6	29	0	6	30	45	4	45	35	0	0	3
H	576	H4-16 Do you troubleshoot AM receiver subassemblies or circuit cards to circuit level components	18	30	4	29	0	4	9	10	2	36	24	0	1	3
H	577	H4-17 Do you align or adjust AM receivers or circuits	19	34	9	34	0	6	29	43	5	45	26	1	1	5
H	578	H4-18 Do you trace block diagrams of single side band (SSB) transmitters	4	8	2	8	0	4	13	10	5	38	18	2	2	11
H	579	H4-19 Do you trace block diagrams of SSB transmitter subassemblies or circuit cards	4	8	2	7	0	4	12	9	4	38	18	1	1	3
H	580	H4-20 Do you trace schematic diagrams of SSB transmitter subassemblies or circuit cards	4	8	2	7	0	4	8	8	4	38	18	1	1	3
H	581	H4-21 Do you troubleshoot SSB transmitters to major units	4	8	1	8	0	3	9	9	5	36	18	1	1	7
H	582	H4-22 Do you troubleshoot SSB transmitters to subassemblies or circuit cards	4	8	1	7	0	3	10	9	4	38	18	0	0	1
H	583	H4-23 Do you troubleshoot SSB transmitter subassemblies or circuit cards to circuit level components	3	8	1	7	0	1	2	3	4	32	12	0	0	1
H	584	H4-24 Do you align or adjust SSB transmitters or circuits	4	6	2	7	0	4	11	8	6	38	18	0	0	1
H	585	H4-25 Do you calculate percentage of modulation for SSB transmitters	3	3	1	9	0	2	7	8	2	36	9	0	0	1
H	586	H4-26 Do you trace block diagrams of SSB receivers	5	8	3	6	0	5	17	8	5	38	18	2	1	10
H	587	H4-27 Do you trace block diagrams of SSB receiver subassemblies or circuit cards	5	7	2	6	0	5	15	7	5	38	18	1	0	3
H	588	H4-28 Do you trace schematic diagrams of SSB receiver subassemblies or circuit cards	5	7	2	6	0	5	11	6	4	38	18	0	0	1
H	589	H4-29 Do you troubleshoot SSB receivers to major units	5	7	2	6	0	4	13	8	4	35	18	0	0	5
H	590	H4-30 Do you troubleshoot SSB receivers to sub-assemblies or circuit cards	5	6	2	6	0	4	12	8	4	38	18	0	0	1
H	591	H4-31 Do you troubleshoot SSB receiver subassemblies or circuit cards to circuit level components	5	6	1	6	0	4	5	3	4	34	9	0	0	1
H	592	H4-32 Do you align or adjust SSB receivers or circuits	5	7	2	6	0	4	11	8	5	36	18	0	0	1
H	593	H4-33 Do you use "FM" modulation principles	25	25	22	58	1	14	37	48	13	42	53	18	4	27
H	594	H4-34 Do you trace block diagrams of FM transmitters	21	25	17	46	1	16	38	53	12	41	50	30	4	39
H	595	H4-35 Do you trace block diagrams of FM transmitter subassemblies or circuit cards	19	24	11	46	1	12	35	52	12	41	47	7	1	8
H	596	H4-36 Do you trace schematic diagrams of FM transmitter subassemblies or circuit cards	19	21	9	43	1	9	30	39	11	38	41	2	0	7
H	597	H4-37 Do you troubleshoot FM transmitters to major units	20	24	13	42	1	9	30	49	11	39	44	15	2	29
H	598	H4-38 Do you troubleshoot FM transmitters to sub-assemblies or circuit cards	19	20	7	43	1	9	29	50	12	40	47	2	0	1
H	599	H4-39 Do you troubleshoot FM transmitter subassemblies or circuit cards to circuit level components	18	18	6	42	1	4	7	13	7	31	29	2	0	1
H	600	H4-40 Do you align or adjust FM transmitters or circuits	22	21	12	48	1	8	25	49	10	36	44	2	0	2
H	601	H4-41 Do you calculate modulation index for FM transmitters	8	12	8	41	1	7	24	2	24	15	1	0	0	2
H	602	H4-42 Do you measure frequency deviation for FM transmitters	16	16	12	54	1	6	20	46	7	32	26	2	0	3
H	603	H4-43 Do you use "FM" demodulation principles	22	47	24	35	0	11	22	37	9	28	47	14	2	16

D T Y	Task Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
H	604	H4-44 Do you trace block diagrams of FM receivers	25	48	22	32	0	15	33	49	8	32	47	20	4	33
H	605	H4-45 Do you trace block diagrams of FM receiver subassemblies or circuit cards	25	47	16	31	0	14	30	49	8	32	44	6	1	9
H	606	H4-46 Do you trace schematic diagrams of FM receiver subassemblies or circuit cards	25	44	14	30	0	12	27	37	8	30	41	2	0	4
H	607	H4-47 Do you troubleshoot FM receivers to major units	26	47	18	29	0	14	28	46	8	30	41	12	2	25
H	608	H4-48 Do you troubleshoot FM receivers to subassemblies or circuit cards	25	42	13	29	0	14	24	48	10	31	44	2	0	3
H	609	H4-49 Do you troubleshoot FM receiver subassemblies or circuit cards to circuit level components	24	38	10	29	0	7	7	13	5	25	26	1	0	1
H	610	H4-50 Do you align or adjust FM receivers or circuits	25	43	18	33	0	11	26	48	9	29	44	1	0	5
H	611	H4-51 Do you plot receiver signal level curves (RSL) for FM receivers	5	17	7	15	0	4	5	6	3	14	9	1	0	0
H	612	H4-52 Do you use "PM" modulation principles	2	22	11	44	2	10	23	31	15	33	50	19	4	13
H	613	H4-53 Do you trace block diagrams of PM transmitters	2	21	6	36	1	13	24	29	17	36	47	30	5	20
H	614	H4-54 Do you trace block diagrams of PM transmitter subassemblies or circuit cards	2	20	4	36	0	12	22	27	16	33	44	8	2	2
H	615	H4-55 Do you trace schematic diagrams of PM transmitter subassemblies or circuit cards	2	18	4	34	0	9	21	22	15	32	44	3	2	2
H	616	H4-56 Do you troubleshoot PM transmitters to major units	2	19	4	33	1	8	23	24	15	33	47	16	5	13
H	617	H4-57 Do you troubleshoot PM transmitters to subassemblies or circuit cards	2	18	3	32	1	9	20	25	14	33	47	0	2	0
H	618	H4-58 Do you troubleshoot PM transmitter subassemblies or circuit cards to circuit level components	2	16	2	31	0	3	7	9	7	27	26	0	2	0
H	619	H4-59 Do you align or adjust PM transmitters or circuits	2	17	3	38	0	5	21	22	14	30	44	0	1	3
H	620	H4-60 Do you calculate pulse recurrence time (PRT) or pulse recurrence frequency (PRF) for PM transmitters	2	13	3	42	1	6	18	17	11	29	35	3	2	5
H	621	H4-61 Do you measure PRT, PRF or pulse width for PM transmitters	2	15	5	44	1	9	25	22	15	34	41	5	2	7
H	622	H4-62 Do you use "PM" demodulation principles	2	41	12	28	1	5	13	23	10	25	47	15	4	9
H	623	H4-63 Do you trace block diagrams of PM receivers	2	42	10	24	0	8	18	25	11	27	44	24	5	16
H	624	H4-64 Do you trace block diagrams of PM receiver subassemblies or circuit cards	2	41	8	23	0	6	17	23	11	27	41	4	2	2
H	625	H4-65 Do you trace schematic diagrams of PM receiver subassemblies or circuit cards	2	38	8	23	0	5	16	19	10	26	41	2	2	1
H	626	H4-66 Do you troubleshoot PM receivers to major units	2	39	8	23	0	5	16	22	11	26	41	14	5	10
H	627	H4-67 Do you troubleshoot PM receivers to subassemblies or circuit cards	2	35	7	23	0	6	15	22	11	26	41	0	2	0
H	628	H4-68 Do you troubleshoot PM receiver subassemblies or circuit cards to circuit level components	2	31	5	22	0	3	6	7	7	22	24	0	2	0
H	629	H4-69 Do you align or adjust PM receivers or circuits	2	37	9	25	0	5	15	19	11	25	38	0	2	2

D	T	Task	Task Title	304	309	316	324	404	451	451	451	451	451	451	452	452	452
Y	T	Nbr		55	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B	51C
H	634	H 634	H5-5 Do you plot graph radiation patterns	1	5	3	1	0	1	4	5	4	4	21	4	0	3
H	635	H 635	H5-6 Do you troubleshoot antenna components	7	52	13	4	0	5	42	40	26	10	50	40	12	35
H	636	H 636	H5-7 Do you measure standing wave ratio (SWR) for antennas	8	21	12	10	0	1	20	29	7	17	35	13	1	39
H	637	H 637	H5-8 Do you work with Yagi antennas	12	2	3	0	0	0	2	1	1	0	3	2	0	1
H	638	H 638	H5-9 Do you work with dipole antennas	11	36	17	7	0	1	50	16	7	19	35	51	9	58
H	639	H 639	H5-10 Do you work with slotted antennas	1	0	3	2	0	1	21	15	1	3	9	18	1	1
H	640	H 640	H5-11 Do you work with rotary antennas	1	2	2	4	0	1	6	4	4	5	12	15	0	10
H	641	H 641	H5-12 Do you work with hertz antennas	0	2	1	1	0	0	2	1	2	2	0	2	0	10
H	642	H 642	H5-13 Do you work with marconi antennas	0	2	0	2	0	1	2	3	2	1	0	3	0	7
H	643	H 643	H5-14 Do you work with rhombic antennas	0	1	0	1	0	0	2	1	1	2	0	3	0	5
H	644	H 644	H5-15 Do you work with scimitar antennas	0	0	0	1	0	1	2	1	1	0	0	2	0	2
H	645	H 645	H5-16 Do you work with parabolic antennas	6	54	11	2	0	1	4	8	20	7	18	9	1	10
H	646	H 646	H5-17 Do you work with ground plane antennas	2	7	8	5	0	1	3	11	4	13	12	8	1	11
H	647	H 647	H5-18 Do you perform tasks on rotary antenna arrays	0	4	2	2	0	1	4	3	3	2	9	10	1	7
H	648	H 648	H5-19 Do you perform tasks on stacked (and fire) antenna arrays	1	1	0	0	0	0	3	1	1	1	9	2	0	1
H	649	H 649	H5-20 Do you perform tasks on broadside antenna arrays	0	0	0	1	0	0	2	1	1	1	3	4	0	1
H	650	H 650	H5-21 Do you perform tasks on cardioid antenna arrays	1	1	1	0	0	0	2	4	1	3	3	4	4	37
H	651	H 651	H5-22 Do you perform tasks on collinear antenna arrays	1	1	0	1	0	1	2	2	1	0	3	2	0	1
H	652	H 652	H5-23 Do you perform tasks on phase antenna arrays	2	19	4	2	0	0	13	20	7	7	53	17	1	12
H	653	H 653	H5-24 Do you perform tasks on planar antenna arrays	2	7	3	1	0	2	41	13	7	2	9	54	6	8
H	654	H 654	H5-25 Do you perform tasks on antennas with vertical polarization	7	14	13	3	1	2	19	16	14	8	38	36	5	13
H	655	H 655	H5-26 Do you perform tasks on antennas with horizontal polarization	7	17	10	3	1	3	20	15	14	5	38	35	5	9
H	656	H 656	H5-27 Do you perform tasks on antennas with circular polarization	2	34	14	3	1	1	18	11	14	5	47	21	2	12
H	657	H 657	H5-28 Do you perform tasks on antennas with unidirectional radiation patterns	9	36	14	5	1	1	16	24	9	11	50	38	6	37
H	658	H 658	H5-29 Do you perform tasks on antennas with bidirectional radiation patterns	6	13	7	4	1	1	15	14	13	9	47	17	5	17
H	659	H 659	H5-30 Do you perform tasks on antennas with omnidirectional radiation patterns	11	22	15	6	1	4	30	23	10	18	41	29	9	64

00043 IX. Radio Frequency (RF) Measurements or Calculations

	IX L.	II RF Measurements
0044		

I	660		Il-1	Do you measure R ⁿ power	22	58	27	79	1	73	90	76	43	95	65	42	7	51
I	661		Il-2	Do you measure RF peak power	17	39	19	75	1	67	80	59	36	86	59	18	2	28
I	662		Il-3	Do you measure RF average power	17	38	16	69	1	55	77	48	28	73	56	15	0	14
I	663		Il-4	Do you measure RF effective power	14	30	13	60	1	43	41	38	18	45	53	18	0	16
I	664		Il-5	Do you measure RF output power using wattmeters	20	37	22	68	1	54	76	63	25	67	50	30	9	62

D
T Task
Y Nbr

304 309 316 324 404 451 451 451 451 451 451 451 452 452 452
55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

Task Title

0045 IX 2. I2 RF Calculations

I 665 I2-1 Do you calculate RF apparent power
I 666 I2-2 Do you calculate RF true power
I 667 I2-3 Do you calculate RF power loss or gain in db

3 18 5 45 2 19 29 17 11 25 26 1 0 5
3 20 8 55 2 22 29 19 13 30 32 1 0 8
8 44 17 73 2 54 74 53 24 75 50 10 2 14

0046 X. Additional Circuits, Devices, Systems, or Items

0047 X 1. J1 Microphones and Speakers

J 668 J1-1 Do you trace block diagrams of circuits containing microphones
J 669 J1-2 Do you trace schematic diagrams of microphone circuits
J 670 J1-3 Do you troubleshoot to isolate a faulty microphone
J 671 J1-4 Do you troubleshoot microphones
J 672 J1-5 Do you work on carbon microphones
J 673 J1-6 Do you work on capacitor microphones
J 674 J1-7 Do you work on crystal microphones
J 675 J1-8 Do you work on dynamic microphones
J 676 J1-9 Do you work on velocity ribbon microphones
J 677 J1-10 Do you trace block diagrams of circuits containing speakers
J 678 J1-11 Do you trace schematic diagrams of speaker circuits
J 679 J1-12 Do you troubleshoot to isolate a faulty speaker
J 680 J1-13 Do you troubleshoot speakers

57 6 11 7 25 1 4 18 2 17 3 9 6 43
56 6 8 7 25 1 3 16 2 16 3 6 6 18
61 7 12 7 27 1 5 19 2 18 6 6 7 35
58 3 7 7 23 1 1 13 1 13 3 0 1 11
45 3 6 3 16 1 1 18 1 16 3 2 1 20
32 0 3 4 10 1 1 2 0 2 3 0 0 2
28 3 5 6 11 1 1 5 0 3 0 0 1 7
56 4 10 6 13 1 2 10 1 11 6 2 1 7
13 0 0 1 3 1 0 1 0 1 0 0 0 0
62 19 10 14 33 3 7 16 1 14 6 4 4 27
60 16 8 13 34 3 5 13 1 13 3 3 4 14
63 17 11 12 36 3 6 17 1 13 3 2 2 21
50 7 8 8 26 3 3 9 0 8 3 0 0 7

0048 X 2. J2 Photosensitive Devices

J 681 J2-1 Do you trace block diagrams of circuits containing photosensitive devices
J 682 J2-2 Do you trace schematic diagrams of photosensitive device circuits
J 683 J2-3 Do you troubleshoot to isolate a faulty photosensitive device
J 684 J2-4 Do you adjust or calibrate photosensitive devices
J 685 J2-5 Do you work on photodiodes
J 686 J2-6 Do you work on phototransistors
J 687 J2-7 Do you work on phototubes
J 688 J2-8 Do you work on photo-SCRs

46 55 14 32 43 29 23 23 5 25 21 10 2 13
46 52 13 32 44 26 22 18 4 23 9 3 1 1
46 52 14 30 44 23 23 19 4 23 9 4 1 4
35 42 11 29 35 15 10 16 3 16 6 0 0 0
30 42 11 24 32 13 13 10 4 23 3 2 0 1
31 13 8 21 22 8 11 4 3 8 6 2 0 0
12 2 2 19 25 6 2 6 1 1 0 1 0 1
9 4 1 16 15 8 5 1 1 3 0 0 0 0

D	Tsk	Task Title	304	309	316	324	404	451	451	451	451	451	451	452	452	452
Y	Nbr		55	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B	51C
J 689	J2-3	Do you work on photocells (Photoconductive or Photovoltaic)	17	30	10	24	38	13	8	8	3	7	6	2	0	2

0049 X 3. J3 Storage Type Display Tubes

J 690	J3-1	Do you trace block diagrams of circuits containing display tubes	5	5	1	26	2	6	6	8	11	11	0	13	1	7
J 691	J3-2	Do you trace schematic diagrams of display tubes or circuits	5	5	1	26	2	6	5	7	11	10	0	8	1	1
J 692	J3-3	Do you troubleshoot to isolate a faulty display tube	5	5	0	25	1	5	5	7	12	11	0	6	1	3
J 693	J3-4	Do you adjust or calibrate display tubes or circuits	4	4	0	27	2	4	4	7	10	10	0	1	0	0
J 694	J3-5	Do you work on direct view storage tubes (DVST)	3	1	1	15	1	1	2	2	11	10	0	3	0	1
J 695	J3-6	Do you work on multiple mode storage tubes (MMST)	1	1	0	8	1	1	1	1	1	2	0	2	0	0
J 696	J3-7	Do you work on scan converter tubes (SCT)	1	1	0	7	1	1	1	0	1	1	0	2	0	0

0050 X 4. J4 Television, Laser, and Infrared Systems

J 697	J4-1	Do you trace block diagrams of TV systems or subassemblies	78	6	9	1	8	3	0	17	0	3	0	2	1	0
J 698	J4-2	Do you trace schematic diagrams of TV systems or component circuits	77	6	4	1	7	2	0	17	0	3	0	2	1	0
J 699	J4-3	Do you troubleshoot TV systems to major subassemblies	78	5	6	1	8	2	0	20	0	3	0	3	1	0
J 700	J4-4	Do you troubleshoot TV systems to circuit level components	78	3	3	1	4	4	2	10	0	3	0	0	0	0
J 701	J4-5	Do you adjust or calibrate TV systems or components	79	4	6	1	6	4	2	19	0	3	0	1	0	0
J 702	J4-6	Do you trace block diagrams of laser systems or subassemblies	7	19	5	2	4	2	2	1	0	0	0	2	2	0
J 703	J4-7	Do you trace schematic diagrams of laser systems or component circuits	7	19	5	2	4	2	2	1	0	0	0	2	1	0
J 704	J4-8	Do you troubleshoot laser systems to major subassemblies	6	19	5	2	4	2	2	1	0	0	0	2	1	0
J 705	J4-9	Do you troubleshoot laser systems to circuit level components	6	18	5	2	4	2	2	1	0	0	0	0	0	0
J 706	J4-10	Do you adjust or calibrate laser systems or components	6	19	5	2	4	2	2	1	0	0	0	0	0	0
J 707	J4-11	Do you trace block diagrams of infrared systems or subassemblies	5	2	4	1	2	2	2	1	1	7	0	1	0	1
J 708	J4-12	Do you trace schematic diagrams of infrared systems or component circuits	5	2	5	1	2	3	2	1	1	8	0	1	0	0
J 709	J4-13	Do you troubleshoot infrared systems to major subassemblies	5	2	5	1	2	3	2	1	1	8	0	1	0	0
J 710	J4-14	Do you troubleshoot infrared systems circuit level components	5	2	5	0	2	2	2	1	1	8	0	0	0	0

Report Option Table for Modules

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Report Option Table for Tasks

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Description of Reported Module Factors

Col	Factor	Source vector	Title	Module Statement	Number Members	Mean	S.D.	Based on All Tasks Within Range	Max	Min	Valid
1	TITLE										

Description of Reported Task Factors

Col	Factor	Source vector	Title	Task Statement	Number Members	Mean	S.D.	Based on All Tasks Within Range	Max	Min	Valid
1	TITLE										
2	F0065	GP0068/PHP	All DAFSC 45252A		85	9.47	15.40	92.94	.00	.00	712
3	F0066	GP0069/PHP	All DAFSC 45252B		105	9.93	17.32	100.00	.00	.00	712
4	F0067	GP0070/PHP	All DAFSC 45252C		98	9.40	15.91	97.96	.00	.00	712
5	F0068	GP0071/PHP	All DAFSC 45253A		97	13.32	18.18	98.97	.00	.00	712
6	F0069	GP0072/PHP	All DAFSC 45253B		61	10.57	18.77	100.00	.00	.00	712
7	F0070	GP0073/PHP	All DAFSC 45253C		68	11.83	18.71	100.00	.00	.00	712
8	F0071	GP0074/PHP	All DAFSC 45271		227	11.70	16.59	95.15	.00	.00	712
9	F0072	GP0075/PHP	All DAFSC 45272		271	11.35	15.98	94.46	.00	.00	712
10	F0073	GP0076/PHP	All DAFSC 45273		147	13.57	17.56	98.64	.00	.00	712
11	F0074	GP0077/PHP	All DAFSC 45550A		149	22.92	22.87	97.32	.00	.00	712
12	F0075	GP0078/PHP	All DAFSC 45550B		146	16.07	19.03	98.63	.00	.00	712

PH0028

PRTMOD Lowry TTC AFSCs (Inventory Order -2 of 3)

Col Factor	Source vector	Title	Number Members	Based on All Tasks Within Range		
				Mean	Max	Min Valid
13 F0094	GP0117/PMP	All DAFSC 455X3A	108	20.25	20.98	98.15 .00 712
14 F0099	GP0139/PMP	All DAFSC 456X0	111	21.07	23.35	97.30 .00 712

452 452 452 452 452 452 452 452 452 452 452 452 452 452 452
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

A	1	Al-1	Do you use metric terms (example mili, kilo, mega)	54	67	52	75	85	71	67	60	79	72	58	76	88
A	2	Al-2	Do you use basic DC electrical/electronic terms	88	97	95	97	97	93	93	94	97	94	97	96	97
A	3	Al-3	Do you use basic AC electrical/electronic terms	88	97	94	96	97	91	93	94	97	93	97	95	97
A	4	Al-4	Do you trace schematic or block diagrams of circuits containing conductors, fuses, lamps, switches, or batteries	86	100	96	96	97	91	92	93	99	97	95	96	97
A	5	Al-5	Do you troubleshoot circuits containing conductors, fuses, lamps, switches, or batteries	84	95	93	87	97	84	86	89	95	95	92	94	95
A	6	Al-6	Do you calculate values of DC voltage, current, resistance, or power	31	25	19	44	46	25	21	26	27	50	28	43	59
A	7	Al-7	Do you calculate values of AC effective voltage, average voltage, or peak-to-peak voltage	14	17	17	39	38	18	16	19	22	49	27	44	55
A	8	Al-8	Do you calculate values of frequency, phase relationship, or wave length	14	17	15	40	33	22	16	18	20	55	27	46	58
A	9	Al-9	Do you trace schematic or block diagrams of circuits containing resistors	52	53	63	67	75	40	48	63	65	89	78	84	85
A	10	Al-10	Do you troubleshoot circuits to isolate a faulty resistor	27	30	46	29	41	13	23	39	31	73	63	55	59
A	11	Al-11	Do you calibrate or adjust circuits by using variable resistors	21	25	18	32	49	18	21	26	38	81	63	71	71
A	12	Al-12	Do you calculate the value of a resistor required for a circuit	13	15	14	14	18	7	13	17	16	32	28	31	26

[illegible]

D	T	Task Title	Y	Nbr	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
B	187	B4-3 Do you use field strength testers			5	6	9	5	16	29	13	7	24	5	6	5	5
B	188	B4-4 Do you use digital multimeters			76	74	73	82	92	91	80	75	84	93	90	87	93
B	189	B4-5 Do you use digital logic probes			6	5	4	4	7	6	8	12	13	30	6	31	
B	190	B4-6 Do you use capacitance testers			20	62	14	16	62	7	15	34	40	5	10	2	5
B	191	B4-7 Do you use capacitor substitution boxes			7	22	4	4	11	9	11	11	12	3	5	2	3
B	192	B4-8 Do you use DC restorers (CRT rejuvenators)			6	5	4	4	5	6	7	6	9	6	6	2	13
B	193	B4-9 Do you use logic current tracers			4	5	4	4	7	4	7	6	10	5	12	3	2
B	194	B4-10 Do you use tube testers			5	6	3	4	5	4	7	6	8	5	6	2	11
B	195	B4-11 Do you use logic pulsers			5	5	4	4	5	4	7	6	10	4	14	3	5
B	196	B4-12 Do you use logic analyzers			5	6	5	4	5	6	8	7	10	9	12	2	5
B	197	B4-13 Do you use signature analyzers			5	5	4	5	7	6	8	6	8	4	5	2	4
B	198	B4-14 Do you use reflectometers			41	42	64	55	39	60	57	62	59	54	22	27	14

00013 III. Amplifier Circuits

00014 III 1. Cl Transistor Amplifier Circuits

C 199	C1-1 Do you trace block diagrams of circuits containing transistor amplifiers	20	10	31	31	38	31	26	26	35	66	44	51	36
C 200	C1-2 Do you trace schematic diagrams of transistor amplifier circuits	15	10	18	18	31	13	19	14	21	64	42	42	24
C 201	C1-3 Do you troubleshoot to isolate a faulty transistor amplifier	6	3	15	6	21	1	7	7	10	55	40	27	21
C 202	C1-4 Do you troubleshoot transistor amplifiers to circuit level components	5	2	7	3	5	1	4	3	5	36	32	19	7
C 203	C1-5 Do you troubleshoot transistor amplifier distortion	2	2	3	2	3	1	4	1	3	15	20	6	5
C 204	C1-6 Do you adjust or align transistor amplifiers	2	2	3	2	5	0	3	1	3	26	21	20	12
C 205	C1-7 Do you measure transistor amplifier voltage, current, or power gain	2	2	4	4	11	3	4	3	6	35	29	21	12
C 206	C1-8 Do you calculate values of transistor amplifier voltage, current or power gain	4	2	2	2	5	1	3	2	4	13	10	7	4
C 207	C1-9 Do you work on compound-connected (Darlington Pair) transistor amplifiers	4	2	4	1	5	0	3	1	3	30	21	6	3
C 208	C1-10 Do you work on cascade-connected transistor amplifiers	4	2	3	1	2	0	3	1	5	19	23	19	6
C 209	C1-11 Do you work on paraphase transistor amplifiers	2	2	2	1	2	1	2	1	3	7	5	5	2
C 210	C1-12 Do you work on push-pull transistor amplifiers	4	4	6	2	3	3	3	3	6	42	34	31	14
C 211	C1-13 Do you work on audio transistor amplifiers	6	7	22	6	5	15	5	13	8	7	28	6	2
C 212	C1-14 Do you work on wideband transistor amplifiers	6	4	7	4	2	10	6	6	5	10	14	11	2
C 213	C1-15 Do you work on IF transistor amplifiers	6	5	10	10	5	16	7	10	7	17	32	28	21
C 214	C1-16 Do you work on RF transistor amplifiers	9	6	16	13	7	16	10	12	13	21	23	44	21
C 215	C1-17 Do you work on buffer transistor amplifiers	6	5	5	7	7	4	6	4	7	39	27	19	7
C 216	C1-18 Do you work on complementary symmetry transistor amplifiers	2	3	2	1	3	1	1	1	3	12	14	2	2
C 217	C1-19 Do you work on DC transistor amplifiers (switching applications)	7	7	4	10	15	4	5	5	12	43	32	30	14

D
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Task Title

452 452 452 452 452 452 452 452 455 455 455 456
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

0015 III 2. C2 Transistor Amplifier Stabilization Circuits

C 218	C2-1 Do you trace schematic diagrams of amplifier stabilization circuits	5	4	4	9	11	3	7	4	9	37	26	20	12
C 219	C2-2 Do you troubleshoot amplifier stabilization circuits to circuit level components	4	2	1	0	7	0	4	0	5	28	24	9	5
C 220	C2-3 Do you perform tasks on emitter (swamping) resistor stabilization amplifiers	1	3	1	3	3	0	2	2	6	22	26	13	5
C 221	C2-4 Do you perform tasks on self-bias stabilization amplifiers	1	2	1	3	2	0	2	1	5	15	21	6	2
C 222	C2-5 Do you perform tasks on thermistor stabilization amplifiers	5	4	1	5	16	1	3	2	9	23	23	22	7
C 223	C2-6 Do you perform tasks on diode stabilization amplifiers	4	3	1	5	8	3	3	2	7	29	26	20	9
C 224	C2-7 Do you perform tasks on double diode stabilization amplifiers	1	1	1	3	2	0	2	1	4	9	18	8	4

0016 III 3. C3 Coupling Circuits

C 225	C3-1 Do you trace block diagrams of circuits containing coupling circuits	16	10	19	12	10	18	13	15	14	45	25	24	21
C 226	C3-2 Do you trace schematic diagrams of coupling circuits	12	10	12	5	7	7	9	10	9	42	25	21	17
C 227	C3-3 Do you troubleshoot circuits to isolate a faulty coupling circuit	7	4	10	4	7	3	2	7	6	29	23	16	14
C 228	C3-4 Do you troubleshoot coupling circuits to circuit level components	4	3	2	3	3	1	2	3	5	21	19	7	8
C 229	C3-5 Do you perform tasks on direct coupling circuits	4	8	9	7	5	4	4	5	8	30	21	14	16
C 230	C3-6 Do you perform tasks on capacitive-resistive coupling circuits	2	8	3	3	7	3	2	2	8	31	20	13	8
C 231	C3-7 Do you perform tasks on capacitive-inductive coupling circuits	2	9	4	3	3	0	2	3	8	27	16	12	7
C 232	C3-8 Do you perform tasks on transformer coupling circuits	7	7	9	2	5	3	6	10	7	26	15	12	13
C 233	C3-9 Do you perform tasks on optical coupling circuits	2	4	1	3	2	1	1	2	4	25	9	2	5

0017 III 4. C4 Electron Tube Amplifier Circuits

C 234	C4-1 Do you trace block diagrams of circuits containing electron tube amplifiers	6	2	2	7	0	3	3	1	2	9	5	23	17
C 235	C4-2 Do you trace schematic diagrams of electron tube amplifiers	4	2	1	3	0	0	1	1	1	9	4	24	14
C 236	C4-3 Do you troubleshoot to isolate a faulty electron tube amplifier	1	1	1	2	0	0	1	0	1	8	3	19	11

D T	Tsk Y Nbr	Task Title
C 262		C5-14 Do you use or apply operational amplifiers as analog/digital (A/D) digital/analog (D/A) converters
C 263		C5-15 Do you use or apply operational amplifiers as multivibrators
C 264		C5-16 Do you use or apply operational amplifiers as modulators/demodulators
<hr/>		
0019		III 6. C6 Magnetic Amplifiers
C 265		C6-1 Do you trace block diagrams of circuits containing magnetic amplifiers
C 266		C6-2 Do you trace schematic diagrams of magnetic amplifier circuits
C 267		C6-3 Do you troubleshoot to isolate a faulty magnetic amplifier
C 268		C6-4 Do you troubleshoot magnetic amplifiers to circuit level components
C 269		C6-5 Do you adjust magnetic amplifiers or components
C 270		C6-6 Do you trace block diagrams of circuits containing saturable reactors
C 271		C6-7 Do you trace schematic diagrams of saturable reactor circuits
C 272		C6-8 Do you troubleshoot to isolate a faulty saturable reactor
C 273		C6-9 Do you troubleshoot saturable reactors to circuit level components
C 274		C6-10 Do you adjust saturable reactor circuits or components

D 275	Dl-1	Do you trace block diagrams of circuits containing power supplies	59	88	37	68	51	51	54	56	56	83	62	85	79
D 276	Dl-2	Do you trace schematic diagrams of power supply circuits	40	79	28	54	41	28	41	42	41	79	51	76	71
D 277	Dl-3	Do you troubleshoot circuits to isolate a faulty power supply	41	85	27	47	38	37	33	38	34	77	53	71	76
D 278	Dl-4	Do you troubleshoot power supplies to circuit level components	15	31	7	13	8	7	9	10	12	52	36	34	25
D 279	Dl-5	Do you align or adjust power supplies	8	19	3	9	8	7	6	8	12	68	39	56	67
D 280	Dl-6	Do you perform tasks on half-wave rectifier power supplies	6	14	3	11	7	10	8	10	14	38	29	28	15

D T Y	Tsk Nbr	Task Title
D	304	D3-6 Do you perform tasks on zener diode power supply voltage regulators
D	305	D3-7 Do you perform tasks on transistor series power supply voltage regulators
D	306	D3-8 Do you perform tasks on IC power supply voltage regulators
D	307	D3-9 Do you perform tasks on pulse width modulator power supply voltage regulators
D	308	D3-10 Do you perform tasks on transistor series power supply voltage regulators with current limiting
D	309	D3-11 Do you perform tasks on crow bar power supply voltage regulators

0024 V. Reactive Circuits

0025 V 1. El Resistive Capacitive Inductive Circuits

E 310	E1-1 Do you trace schematic or block diagrams of circuits containing resistive capacitive inductive (RCL) circuits	14	14	8	20	18	10	11	14	15	32	29	22	10
E 311	E1-2 Do you troubleshoot RCL circuits to circuit level components	2	6	2	2	5	1	4	5	4	17	23	8	5
E 312	E1-3 Do you trace schematic or block diagrams of circuits containing resonant RCL circuits	11	12	4	9	13	7	7	8	10	28	24	17	9
E 313	E1-4 Do you troubleshoot resonant RCL circuits to circuit level components	2	4	2	2	3	1	3	2	4	14	18	5	5
E 314	E1-5 Do you calculate values of impedance, voltage, or current in RCL circuits	2	7	1	2	7	1	3	3	3	8	8	3	3
E 315	E1-6 Do you calculate phase angle of RCL circuits	2	4	1	1	2	0	1	1	2	6	8	3	3
E 316	E1-7 Do you calculate values of power in RCL circuits	2	6	1	1	3	1	2	1	3	7	8	2	2

0026	V 2.	E2 Frequency Sensitive Filters
0026	V 2.	E2 Frequency Sensitive Filters

E 317	E2-1 Do you trace schematic or block diagrams of circuits containing frequency sensitive filters	11	8	9	8	11	16	11	10	10	18	13	16	8
E 318	E2-2 Do you troubleshoot circuits to isolate a faulty frequency sensitive filter	2	2	4	1	5	7	5	5	5	15	11	11	4
E 319	E2-3 Do you troubleshoot frequency sensitive filters to circuit level components	1	1	1	0	2	3	2	2	4	13	8	3	1
E 320	E2-4 Do you align or adjust frequency sensitive filters	1	2	1	2	0	1	2	1	4	13	8	7	3
E 321	E2-5 Do you calculate capacitance or inductance values for specific frequency sensitive filters	1	2	1	0	2	3	2	1	3	5	3	3	2
E 322	E2-6 Do you perform tasks on low pass frequency sensitive filters	1	4	3	1	3	6	6	4	4	15	13	10	6

D	T	Task Title	Y	Nbr
E	323	E2-7 Do you perform tasks on high pass frequency sensitive filters	1	4
E	324	E2-8 Do you perform tasks on band pass frequency sensitive filters	2	2
E	325	E2-9 Do you perform tasks on band-reject frequency sensitive filters	2	1
E	326	E2-10 Do you perform tasks on ferrite bead frequency sensitive filters	1	1

0027 VI. Waveshaping/Generating Circuits

0028 VI 1. FI Oscillators

F 327	Fl-1 Do you trace block diagrams of circuits containing oscillators	19	8	8	35	10	16	25	17	20	42	27	50	38
F 328	Fl-2 Do you trace schematic diagrams of oscillator circuits	11	5	2	13	3	7	15	6	11	40	24	44	30
F 329	Fl-3 Do you troubleshoot to isolate a faulty oscillator circuit	6	3	3	10	5	3	6	6	8	32	21	34	27
F 330	Fl-4 Do you troubleshoot oscillators to circuit level components	5	1	1	3	0	1	1	1	5	18	19	15	10
F 331	Fl-5 Do you align or adjust oscillator circuits	1	2	1	11	2	1	2	1	6	23	16	33	20
F 332	Fl-6 Do the oscillators you work with use LC tank circuits	4	3	3	7	5	4	6	5	5	21	17	21	10
F 333	Fl-7 Do the oscillators you work with use RC networks	5	5	2	9	2	4	7	7	7	24	21	22	15
F 334	Fl-8 Do the oscillators you work with use crystals	6	3	2	20	2	9	10	7	7	20	10	40	28
F 335	Fl-9 Do the oscillators you work with use phase lock loops (PLL)	6	3	3	6	2	6	7	8	7	21	12	9	14
F 336	Fl-10 Do you perform tasks on series Hartley oscillator circuits	1	1	1	3	2	3	1	3	3	7	6	7	2
F 337	Fl-11 Do you perform tasks on shunt Hartley oscillator circuits	1	1	1	3	0	3	1	3	3	9	9	7	3
F 338	Fl-12 Do you perform tasks on Colpitts oscillator circuits	1	1	0	4	2	3	2	3	2	10	3	6	2
F 339	Fl-13 Do you perform tasks on Clapp oscillator circuits	1	1	1	3	0	3	1	2	2	5	3	0	2
F 340	Fl-14 Do you perform tasks on voltage control oscillators (VCO/VTD)	1	3	1	7	2	1	6	5	4	14	11	20	23
F 341	Fl-15 Do you perform tasks on crystal oscillator circuits	1	1	2	8	2	4	4	5	4	15	12	30	20
F 342	Fl-16 Do you perform tasks on Wien bridge oscillator circuits	1	1	1	2	2	1	1	2	1	11	4	5	3
F 343	Fl-17 Do you perform tasks on pulse generating oscillator circuits	1	4	1	6	2	4	2	4	3	22	15	25	7
F 344	Fl-18 Do you perform tasks on blocked/blocking oscillator circuits	1	2	1	3	0	3	1	3	2	8	13	5	4
F 345	Fl-19 Do you perform tasks on burst generators	1	1	1	3	2	4	2	2	1	6	4	0	5
F 346	Fl-20 Do you perform tasks on RC phase shift oscillators	1	2	1	5	2	3	2	4	3	13	12	6	5

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452 452 452 452 452 452 452 452 452 452 455 455 455 456
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

Task Title

0031 VI 4. F4 Limiter/Clamper Circuits

F 373	F4-1 Do you trace block diagrams of circuits containing limiters	9	6	4	11	5	4	11	7	3	41	24	22	14
F 374	F4-2 Do you trace schematic diagrams of limiter circuits	7	5	3	4	3	0	4	3	2	40	24	17	10
F 375	F4-3 Do you trace block diagrams of circuits containing clammers	6	2	4	5	2	0	3	2	1	36	23	13	10
F 376	F4-4 Do you trace schematic diagrams of clamper circuits	6	2	3	2	2	1	2	1	1	32	21	14	10
F 377	F4-5 Do you troubleshoot to isolate a faulty limiter circuit	4	2	2	3	2	0	1	1	0	23	21	12	7
F 378	F4-6 Do you troubleshoot limiters to circuit level components	2	2	2	0	0	0	1	1	0	14	18	6	5
F 379	F4-7 Do you troubleshoot to isolate a faulty clamper circuit	2	2	2	1	0	0	1	1	0	22	20	8	6
F 380	F4-8 Do you troubleshoot clammers to circuit level components	2	2	2	0	0	0	1	1	0	13	19	6	5
F 381	F4-9 Do you perform tasks on series diode limiter circuits	2	1	1	1	2	0	1	2	0	23	19	10	8
F 382	F4-10 Do you perform tasks on shunt diode limiter circuits	2	2	2	3	0	0	1	3	0	25	20	9	6
F 383	F4-11 Do you perform tasks on bias limiter circuits	2	2	1	2	2	0	1	1	0	18	12	8	5
F 384	F4-12 Do you perform tasks on zener diode circuits	2	2	2	4	2	0	2	3	1	32	22	17	12
F 385	F4-13 Do you perform tasks on transistor limiter circuits	2	2	2	2	2	0	1	1	1	19	16	7	7
F 386	F4-14 Do you perform tasks on triode limiter circuits	2	1	2	0	0	0	1	0	0	5	8	4	3
F 387	F4-15 Do you perform tasks on diode clamper circuits	2	1	2	1	0	0	1	2	0	23	19	10	9
F 388	F4-16 Do you perform tasks on bias clamper circuits	2	1	1	1	0	0	1	1	0	16	12	6	5

0032 VII. Computers, Digital Circuits, and Devices

0033 VII 1. G1 Digital Logic Numbering Systems and Functions

G 389	G1-1 Do you convert decimal numbers to binary numbers or binary numbers to decimal	12	18	6	41	33	18	52	19	30	29	23	30	43
G 390	G1-2 Do you convert octal numbers to binary or binary numbers to octal	11	14	5	39	15	16	46	13	26	23	12	24	38
G 391	G1-3 Do you convert hexadecimal numbers to binary or binary numbers to hexadecimal	7	14	4	28	13	12	31	14	20	26	15	24	42
G 392	G1-4 Do you convert octal numbers to decimal or decimal numbers to octal	15	12	6	38	16	15	37	11	24	23	10	21	33
G 393	G1-5 Do you convert hexadecimal numbers to decimal or decimal numbers to hexadecimal	7	14	5	25	11	15	28	15	22	24	14	25	35
G 394	G1-6 Do you convert octal numbers to hexadecimal or hexadecimal numbers to octal	8	11	4	22	10	12	26	9	21	21	10	18	28
G 395	G1-7 Do you convert base number fractions to another base numbering system	7	10	6	14	10	12	15	8	12	17	12	14	17
G 396	G1-8 Do you add binary numbers	7	6	3	22	20	10	22	11	17	25	20	24	23

D T Y	Task Title																
		452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452
G 397	Do you subtract binary numbers	52A	52B	52C	53A	53B	53C	71	72	73	50A	50B	50C	50D	50E	50F	50G
G 398	Do you multiply binary numbers	6	5	3	21	18	12	19	10	16	24	19	22	21			
G 399	Do you divide binary numbers	7	4	3	12	3	7	9	6	5	8	20	14	18	6		
G 400	Do you add octal numbers	6	4	3	13	3	7	8	5	8	20	14	18	6			
G 401	Do you subtract octal numbers	6	4	3	27	3	10	15	7	14	20	9	19	13			
G 402	Do you add hexadecimal numbers	7	4	3	25	3	10	14	7	14	20	9	19	12			
G 403	Do you subtract hexadecimal numbers	6	5	3	13	5	10	10	7	11	20	12	17	14			
G 404	Do you use binary coded decimal (BCD)	6	5	3	13	5	9	10	7	11	20	12	17	12			
G 405	Do you use gray codes	7	9	5	28	25	15	43	14	20	28	21	22	38			
G 406	Do you use ICAO codes	2	2	1	5	0	0	5	5	6	3	3	6	5			
G 407	Do you use excess-3 (XS3) codes	2	2	0	4	0	0	5	3	3	3	1	0	2			
G 408	Do you use parity bit codes	2	2	2	5	0	0	5	4	3	9	10	7	3			
G 409	Do you use binary codes	6	8	2	20	8	0	11	8	8	19	7	11	23			
G 410	Do you use ASCII codes	4	2	1	4	0	0	4	3	4	3	1	2	3			
G 411	Do you use EBCDIC codes	6	3	1	5	0	1	8	6	5	11	5	15	31			
G 412	Do you trace data flow through logic symbol diagrams	5	2	1	4	0	0	4	3	4	3	1	1	3			
G 413	Do you trace data flow through logic schematic diagrams	16	26	11	39	41	21	52	31	39	47	23	48	50			
G 414	Do you troubleshoot digital systems to major units	15	23	13	38	38	13	46	25	35	46	24	45	45			
G 415	Do you troubleshoot digital systems subassemblies or circuit cards	16	19	12	42	25	19	41	28	33	44	23	50	53			
G 416	Do you troubleshoot digital systems, subsystems or circuit cards to circuit level components or IC	4	4	1	6	2	0	7	4	7	41	22	28	32			
G 417	Do you trace data flow through circuits using positive logic (High = Binary 1)	2	2	1	6	0	0	6	4	6	26	18	8	22			
G 418	Do you trace data flow through circuits using negative logic (High = Binary 0)	7	12	0	21	18	10	24	12	21	38	19	21	31			
G 419	Do you perform tasks related to AND gates	8	11	1	21	16	9	19	11	20	30	18	17	27			
G 420	Do you perform tasks related to OR gates	7	27	9	28	39	16	36	26	31	53	30	39	38			
G 421	Do you perform tasks related to inhibited gates	7	28	8	29	39	18	36	26	30	53	30	39	37			
G 422	logic functions	5	18	6	24	20	10	26	17	19	50	25	34	31			
G 423	Do you perform tasks related to NAND or NOR gates	5	26	7	27	39	13	35	23	29	52	28	39	36			
G 424	Do you perform tasks related to exclusive OR/NOR	5	23	5	22	15	12	26	16	20	50	23	33	32			
G 425	logic functions	2	11	0	15	5	4	10	8	9	25	17	19	23			
G 426	Do you perform tasks related to RS flip flops	2	9	1	10	5	4	11	8	10	26	17	19	23			
G 427	Do you perform tasks related to D(Data) flip flops	2	10	0	9	7	1	11	8	10	24	18	17	23			
G 428	Do you perform tasks related to T(Toggle) flip flops	2	7	0	6	5	1	7	7	7	36	18	12	28			
G 429	Do you perform tasks related to JK flip flops	1	7	1	10	3	1	8	6	6	26	16	19	23			
G 430	Do you perform tasks related to Schmitt triggers	2	10	1	13	3	4	12	8	10	28	14	17	23			
G 431	logic functions	4	5	0	7	7	3	8	6	9	20	17	12	16			
G 432	Do you perform tasks related to open collector gates (wired "AND" or wired "OR")	5	9	2	18	3	6	14	10	12	33	18	22	27			
G 433	Do you perform tasks related to buffers	6	16	6	15	10	4	17	16	16	38	21	29	29			
G 434	Do you perform tasks related to inverters	2	5	2	10	5	3	8	6	7	20	14	13	17			
G 435	Do you perform tasks related to complemented flip flops	2	5	2	11	5	3	8	6	7	23	14	13	17			
G 436	Do you perform tasks related to complementing flip flops	2	5	2	11	5	3	8	6	7	23	14	13	17			

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
G	435	G1-47 Do you develop Boolean equations from logic circuits or diagrams	4	5	2	9	5	1	8	9	10	15	12	8	6
G	436	G1-48 Do you develop logic diagrams from Boolean equations	1	5	1	9	3	1	7	7	7	14	11	8	5
G	437	G1-49 Do you simplify Boolean expressions using Boolean algebra	4	5	1	11	2	1	7	8	8	15	12	6	4
G	438	G1-50 Do you perform tasks on RTL (resistor transistor logic formally DCTL)	1	3	2	4	5	0	4	4	5	10	8	3	6
G	439	G1-51 Do you perform tasks on DTL (diode transistor logic)	1	3	3	6	5	0	5	4	5	8	8	3	5
G	440	G1-52 Do you perform tasks on TTL (transistor transistor logic)	4	3	4	5	5	0	5	6	6	21	17	6	23
G	441	G1-53 Do you perform tasks on ECL/CML (emitter coupled or current mode logic)	2	3	1	4	2	0	4	4	5	11	3	5	5
G	442	G1-54 Do you perform tasks on HTL (high threshold logic)	2	2	1	4	0	0	4	3	5	5	3	1	3
G	443	G1-55 Do you perform tasks on CMOS (complementary metal oxide semiconductor)	1	2	2	5	0	0	4	4	6	16	14	5	12
G	444	G1-56 Do you perform tasks on positive MOS ICs	2	2	1	5	0	0	4	3	5	8	8	2	6
G	445	G1-57 Do you perform tasks on negative MOS ICs	2	2	1	5	0	1	4	3	5	7	7	2	6
G	446	G1-58 Do you perform tasks on vertical MOS ICs	2	2	1	5	0	0	4	3	5	4	2	1	5

0034 VII 2. G2 Computers

G 447	G2-1 Do you trace block or schematic diagrams of computer controlled or computer based systems	44	37	17	62	33	37	51	40	41	33	4	67	67
G 448	G2-2 Do you load programs	38	10	20	53	10	29	43	30	35	40	2	61	67
G 449	G2-3 Do you write or debug programs	5	6	4	3	2	1	7	6	6	5	1	3	7
G 450	G2-4 Do you troubleshoot computers to a major unit	27	20	15	48	18	26	32	24	31	28	3	47	61
G 451	G2-5 Do you troubleshoot computers to a subassembly or circuit card	6	8	3	6	3	3	4	6	5	28	3	48	41
G 452	G2-6 Do you troubleshoot computer subassembly or circuit card to circuit level components or IC	5	7	3	5	2	0	4	4	5	12	2	6	14
G 453	G2-7 Do you use computer flow charts or diagrams	16	14	4	29	16	13	32	13	21	17	1	38	43
G 454	G2-8 Do you perform tasks on analog computers	11	29	11	44	33	22	28	18	31	13	5	13	37
G 455	G2-9 Do you perform tasks on digital computers	32	31	19	58	34	35	52	35	47	41	5	81	77
G 456	G2-10 Do you use Basic computer language	8	6	5	9	3	4	10	8	10	9	2	11	13
G 457	G2-11 Do you use COBOL computer language	2	4	2	5	2	1	3	4	5	1	0	1	4
G 458	G2-12 Do you use FORTRAN computer language	2	4	3	4	2	1	4	4	5	5	0	4	4
G 459	G2-13 Do you use ADA computer language	1	4	2	3	2	0	3	3	5	3	0	0	0
G 460	G2-14 Do you use ATLAS computer language	1	4	3	4	2	3	3	3	4	2	0	0	1
G 461	G2-15 Do you use ELAN computer language	1	4	2	3	2	1	3	3	3	3	0	0	0
G 462	G2-16 Do you use PASCAL computer language	1	4	3	3	2	0	4	4	5	2	1	0	0
G 463	G2-17 Do you use RPG computer language	1	4	2	4	2	1	3	3	5	2	0	0	0
G 464	G2-18 Do you use Machine computer language	1	4	3	4	2	0	4	4	5	9	1	6	8
G 465	G2-19 Do you use C computer language	2	4	3	3	2	1	4	4	5	2	0	0	0
G 466	G2-20 Do you perform tasks on magnetic (tape, disc, core) computer memories	9	10	3	29	15	21	22	16	18	34	3	59	60
G 467	G2-21 Do you perform tasks on semiconductor (RAM, ROM, EPROM, PROM) computer memories	13	16	9	25	10	7	19	21	16	19	5	31	40

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0037 VIII. Transmission/Reception Circuits, Devices, and Systems

0038 VIII 1. H1 Connections

H 524	H1-1 Do you measure electrical length on transmission lines	9	4	16	15	3	38	21	12	18	6	0	6	17
H 525	H1-2 Do you measure physical length on transmission lines	12	4	19	33	3	49	34	15	26	11	3	5	20
H 526	H1-3 Do you measure standing wave ratio (SWR) on transmission lines	8	3	47	13	5	62	27	25	35	5	0	5	25
H 527	H1-4 Do you construct transmission lines	8	3	16	26	3	38	30	13	22	10	1	4	14
H 528	H1-5 Do you match transmission line impedance with loads	7	2	16	6	2	26	12	7	12	3	1	5	14
H 529	H1-6 Do you calculate the characteristic impedance (Z0) of transmission lines	6	2	7	3	0	16	9	6	7	3	0	2	2
H 530	H1-7 Do you troubleshoot transmission lines	28	7	50	35	10	76	43	33	35	14	3	13	16
H 531	H1-8 Do you perform tasks on open-wire transmission lines	20	4	10	18	8	26	24	19	19	7	1	7	5
H 532	H1-9 Do you perform tasks on twisted pair transmission lines	35	9	19	24	8	29	52	34	33	11	1	12	16
H 533	H1-10 Do you perform tasks on twin lead transmission lines	13	3	10	10	3	10	19	11	13	9	1	3	4
H 534	H1-11 Do you perform tasks on flexible coaxial transmission lines	47	7	56	58	15	78	59	49	52	17	4	25	29
H 535	H1-12 Do you perform tasks on rigid coaxial transmission lines	33	5	41	23	3	63	38	34	41	7	1	18	9
H 536	H1-13 Do you perform tasks on fiber-optic transmission lines	5	1	4	2	0	6	7	6	4	5	0	0	3
H 537	H1-14 Do you trace schematic or block diagrams of circuits containing waveguides	78	13	20	77	15	66	66	52	58	8	1	73	68
H 538	H1-15 Do you troubleshoot circuits to isolate a faulty waveguide assembly	76	11	18	75	10	57	63	48	52	8	0	70	59
H 539	H1-16 Do you pressurize or purge waveguide assemblies	81	10	16	78	11	57	69	50	58	7	1	69	72
H 540	H1-17 Do you measure standing wave ratio for waveguide assemblies	12	7	6	18	2	47	22	12	19	3	0	14	29
H 541	H1-18 Do you remove or install waveguide or associated coupling hardware components	86	14	15	78	10	60	68	52	56	8	2	72	75

0039 VIII 2. H2 Microwave Oscillators and Amplifiers

H 542	H2-1 Do you trace schematic or block diagrams of circuits containing microwave oscillators or amplifiers	21	5	4	33	11	10	33	14	16	6	0	52	32
H 543	H2-2 Do you troubleshoot circuits to isolate a faulty microwave oscillator or amplifier	12	3	2	15	5	3	19	5	6	6	0	46	25
H 544	H2-3 Do you tune or adjust microwave oscillators or amplifiers	2	1	2	26	5	1	4	2	7	5	0	49	23
H 545	H2-4 Do you perform tasks on two-cavity klystron microwave oscillators and amplifiers	1	1	0	9	0	1	2	1	6	3	0	30	7

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H 546	H2-5 Do you perform tasks on three-cavity klystron microwave oscillators and amplifiers	1	2	0	3	0	0	2	1	3	2	0	18	1
H 547	H2-6 Do you perform tasks on reflex klystron microwave oscillators and amplifiers	1	1	0	23	2	0	2	1	8	4	0	23	5
H 548	H2-7 Do you perform tasks on traveling wave tube microwave oscillators and amplifiers	13	2	2	22	3	4	11	10	7	5	0	8	4
H 549	H2-8 Do you perform tasks on magnetron microwave oscillators and amplifiers	5	1	1	31	5	1	6	4	12	5	0	60	30
H 550	H2-9 Do you perform tasks on backward wave oscillator	1	1	1	3	0	0	2	1	1	2	0	5	1
H 551	H2-10 Do you perform tasks on parametric amplifiers	1	1	1	2	0	1	2	1	1	2	0	15	1
H 552	H2-11 Do you perform tasks on yttrium iron garnet (YIG) tuned microwave oscillators and amplifiers	1	1	1	4	0	0	4	1	0	3	0	1	1

0040 VIII 3. H3 Resonant Cavities

H 553	H3-1 Do you trace schematic or block diagrams of circuits containing resonant cavities	2	3	0	9	5	1	6	4	3	11	1	37	21
H 554	H3-2 Do you troubleshoot circuits to isolate a faulty resonant cavity	0	3	0	4	3	0	3	1	0	10	1	29	14
H 555	H3-3 Do you tune or adjust resonant cavities electrically	1	1	1	5	2	0	0	0	3	10	1	31	14
H 556	H3-4 Do you tune or adjust resonant cavities physically	0	1	0	11	2	0	0	0	1	7	1	38	7
H 557	H3-5 Do you measure frequency of resonant cavities	1	1	1	4	2	0	1	0	0	11	1	30	14
H 558	H3-6 Do you perform tasks on probe resonant cavities	1	3	0	3	3	0	0	1	1	2	0	5	7
H 559	H3-7 Do you perform tasks on loop resonant cavities	0	1	0	4	0	0	1	2	1	3	1	4	2
H 560	H3-8 Do you perform tasks on aperture (iris/window) resonant cavities	0	1	0	3	2	0	1	1	0	6	1	5	5

0041 VIII 4. H4 Transmitters and Receivers

H 561	H4-1 Do you use "AM" modulation principles	8	8	35	20	7	47	10	24	27	5	0	25	2
H 562	H4-2 Do you trace block diagrams of AM transmitters	15	9	53	19	8	59	15	34	29	4	1	27	2
H 563	H4-3 Do you trace block diagrams of AM transmitter subassemblies or circuit cards	6	4	13	6	3	15	6	11	9	4	1	22	2
H 564	H4-4 Do you trace schematic diagrams of AM transmitter subassemblies or circuit cards	4	3	10	4	3	7	4	6	7	3	1	18	2
H 565	H4-5 Do you troubleshoot AM transmitters to major units	11	8	38	18	7	50	12	23	23	3	1	23	3
H 566	H4-6 Do you troubleshoot AM transmitters to subassemblies or circuit cards	4	2	6	0	2	4	3	3	3	4	1	17	2
H 567	H4-7 Do you troubleshoot AM transmitter subassemblies or circuit cards to circuit level components	2	2	6	0	2	3	3	3	1	3	1	6	2
H 568	H4-8 Do you align or adjust AM transmitters or circuits	1	1	8	6	2	7	3	4	3	3	1	19	2
H 569	H4-9 Do you calculate percentage of modulation for AM transmitters	2	3	15	4	2	4	3	7	5	3	1	8	1
H 570	H4-10 Do you use "AM" demodulation principles	7	7	23	16	5	41	9	21	21	3	0	6	2
H 571	H4-11 Do you trace block diagrams of AM receivers	15	9	48	18	7	63	15	33	27	3	0	13	2

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H	604	H4-44 Do you trace block diagrams of FM receivers	18	10	42	20	7	44	22	36	20	4	3	10	6
H	605	H4-45 Do you trace block diagrams of FM receiver subassemblies or circuit cards	4	3	11	3	3	4	8	10	5	4	3	8	5
H	606	H4-46 Do you trace schematic diagrams of FM receiver subassemblies or circuit cards	4	4	8	1	3	3	4	6	3	4	3	7	4
H	607	H4-47 Do you troubleshoot FM receivers to major units	11	8	32	16	7	35	14	25	16	4	3	10	5
H	608	H4-48 Do you troubleshoot FM receivers to subassemblies or circuit cards	2	2	4	0	0	1	3	3	1	3	3	7	4
H	609	H4-49 Do you troubleshoot FM receiver subassemblies or circuit cards to circuit level components	2	2	5	1	0	1	3	3	1	3	2	5	2
H	610	H4-50 Do you align or adjust FM receivers or circuits	2	2	8	3	2	4	4	5	4	3	3	10	5
H	611	H4-51 Do you plot receiver signal level curves (RSL) for FM receivers	1	1	6	1	0	1	3	3	1	1	1	2	2
H	612	H4-52 Do you use "PM" modulation principles	11	1	9	24	3	25	11	12	16	6	1	22	11
H	613	H4-53 Do you trace block diagrams of PM transmitters	21	1	6	33	7	24	19	14	19	8	1	33	21
H	614	H4-54 Do you trace block diagrams of PM transmitter subassemblies or circuit cards	4	0	2	8	2	1	5	5	4	9	1	24	15
H	615	H4-55 Do you trace schematic diagrams of PM trans- mitter subassemblies or circuit cards	4	0	3	7	2	0	4	3	3	8	1	20	15
H	616	H4-56 Do you troubleshoot PM transmitters to major units	15	1	5	23	7	19	11	12	16	7	1	28	22
H	617	H4-57 Do you troubleshoot PM transmitters to sub- assemblies or circuit cards	2	0	2	4	0	0	2	1	1	8	1	18	14
H	618	H4-58 Do you troubleshoot PM transmitter subassemblies or circuit cards to circuit level components	2	0	2	4	0	0	2	1	1	5	1	9	6
H	619	H4-59 Do you align or adjust PM transmitters or circuits	1	0	3	5	2	0	2	1	5	7	1	28	15
H	620	H4-60 Do you calculate pulse recurrence time (PRT) or pulse recurrence frequency (PRF) for PM transmitters	4	0	3	5	0	3	4	3	2	7	1	13	17
H	621	H4-61 Do you measure PRT, PRF or pulse width for PM transmitters	4	0	2	14	0	4	6	3	5	8	1	25	21
H	622	H4-62 Do you use "PM" demodulation principles	5	2	8	20	2	24	10	14	14	5	1	15	9
H	623	H4-63 Do you trace block diagrams of PM receivers	12	2	9	25	7	21	15	15	18	7	1	22	17
H	624	H4-64 Do you trace block diagrams of PM receiver subassemblies or circuit cards	1	1	2	5	2	1	4	5	4	7	1	16	14
H	625	H4-65 Do you trace schematic diagrams of PM receiver subassemblies or circuit cards	1	1	1	3	4	2	0	4	3	7	1	15	14
H	626	H4-66 Do you troubleshoot PM receivers to major units	9	2	8	21	7	19	9	11	16	7	1	21	18
H	627	H4-67 Do you troubleshoot PM receivers to subassemblies or circuit cards	1	0	1	3	0	0	2	1	0	5	1	13	14
H	628	H4-68 Do you troubleshoot PM receiver subassemblies or circuit cards to circuit level components	1	0	0	4	0	0	2	1	0	4	1	7	7
H	629	H4-69 Do you align or adjust PM receivers or circuits	1	0	2	5	2	0	2	1	5	6	1	19	16

0042 VIII 5. H5 Antennas

H 630	H5-1	Do you physically align antennas	22	8	18	60	3	25	21	15	28	7	1	65	66
H 631	H5-2	Do you electrically align antennas	14	3	5	55	5	18	14	6	20	6	1	72	68
H 632	H5-3	Do you troubleshoot loading of antennas	9	6	17	18	3	38	11	14	18	5	0	19	14
H 633	H5-4	Do you troubleshoot coupling of antennas	13	5	19	23	5	47	16	18	27	5	0	20	15

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			452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452
H	634	H5-5 Do you plot graph radiation patterns	5	1	5	3	0	3	5	4	6	3	0	4	3												
H	635	H5-6 Do you troubleshoot antenna components	19	7	27	24	7	51	30	25	30	7	0	47	55												
H	636	H5-7 Do you measure standing wave ratio (SWR) for antennas	7	3	41	9	5	51	19	27	29	3	0	5	10												
H	637	H5-8 Do you work with Yagi antennas	2	0	5	3	0	4	4	4	2	2	0	1	0												
H	638	H5-9 Do you work with dipole antennas	11	5	29	32	7	60	45	22	35	3	0	33	3												
H	639	H5-10 Do you work with slotted antennas	18	0	7	5	2	19	8	11	13	4	0	1	0												
H	640	H5-11 Do you work with rotary antennas	2	0	8	12	2	22	12	5	10	2	0	13	32												
H	641	H5-12 Do you work with hertz antennas	4	0	8	3	0	21	7	8	4	2	0	1	0												
H	642	H5-13 Do you work with marconi antennas	2	0	9	2	0	18	7	7	2	0	1	1													
H	643	H5-14 Do you work with rhombic antennas	2	0	7	6	2	34	11	6	14	2	0	2	0												
H	644	H5-15 Do you work with scimitar antennas	2	0	4	4	0	6	4	4	3	2	0	1	0												
H	645	H5-16 Do you work with parabolic antennas	9	1	10	57	5	18	14	10	33	3	0	50	67												
H	646	H5-17 Do you work with ground plane antennas	5	0	11	6	2	12	12	11	14	3	0	1	1												
H	647	H5-18 Do you perform tasks on rotary antenna arrays	2	0	6	11	0	18	7	5	9	2	0	10	25												
H	648	H5-19 Do you perform tasks on stacked (end fire) antenna arrays	2	0	5	2	0	4	4	4	2	2	0	1	0												
H	649	H5-20 Do you perform tasks on broadside antenna arrays	2	0	5	2	0	4	4	4	3	3	0	2	1												
H	650	H5-21 Do you perform tasks on cardioid antenna arrays	2	0	12	7	0	38	11	10	13	3	0	2	2												
H	651	H5-22 Do you perform tasks on collinear antenna arrays	5	0	5	5	0	6	4	4	6	2	0	1	0												
H	652	H5-23 Do you perform tasks on phase antenna arrays	15	2	11	12	2	13	15	14	7	4	0	16	10												
H	653	H5-24 Do you perform tasks on planar antenna arrays	34	3	9	34	2	10	27	19	12	3	0	1	1												
H	654	H5-25 Do you perform tasks on antennas with vertical polarization	9	3	13	55	7	31	15	14	34	3	0	17	13												
H	655	H5-26 Do you perform tasks on antennas with horizontal polarization	11	0	9	52	7	31	16	13	35	4	0	19	15												
H	656	H5-27 Do you perform tasks on antennas with circular polarization	11	0	9	69	7	32	11	15	38	4	0	51	11												
H	657	H5-28 Do you perform tasks on antennas with unidirectional radiation patterns	19	6	29	43	5	51	26	26	29	7	0	19	25												
H	658	H5-29 Do you perform tasks on antennas with bidirectional radiation patterns	16	6	18	31	3	40	17	14	21	5	0	19	22												
H	659	H5-30 Do you perform tasks on antennas with omnidirectional radiation patterns	20	9	59	35	8	79	34	36	41	4	0	21	11												

0043 IX. Radio Frequency (RF) Measurements or Calculations

0044 IX 1. I1 RF Measurements

I	660	I1-1 Do you measure RF power	6	7	49	20	7	75	36	28	31	8	3	69	50												
I	661	I1-2 Do you measure RF peak power	4	3	26	16	2	40	15	11	14	8	3	49	45												
I	662	I1-3 Do you measure RF average power	4	3	18	10	2	32	13	13	12	7	3	36	32												
I	663	I1-4 Do you measure RF effective power	4	4	20	11	3	34	13	11	12	7	3	25	19												
I	664	I1-5 Do you measure RF output power using wattmeters	7	8	60	20	7	87	37	39	39	6	0	24	26												

D
T Task
Y Nbr

Task Title

452 452 452 452 452 452 452 452 455 455 455 456
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

0045 IX 2. I2 RF Calculations

I 665 I2-1 Do you calculate RF apparent power 1 2 9 2 2 10 5 6 5 5 0 13 14
I 666 I2-2 Do you calculate RF true power 1 2 9 2 2 9 5 6 7 5 0 12 21
I 667 I2-3 Do you calculate RF power loss or gain in db 2 2 18 7 3 26 9 10 13 7 0 30 28

0046 X. Additional Circuits, Devices, Systems, or Items

0047 X 1. J1 Microphones and Speakers

J 668 J1-1 Do you trace block diagrams of circuits containing microphones 8 10 45 13 2 62 26 29 23 3 1 0 0
J 669 J1-2 Do you trace schematic diagrams of microphone circuits 7 8 30 9 2 29 20 20 14 3 1 0 0
J 670 J1-3 Do you troubleshoot to isolate a faulty microphone 5 10 32 11 2 50 21 23 21 3 1 0 0
J 671 J1-4 Do you troubleshoot microphones 4 5 15 3 2 18 7 7 10 3 1 0 1
J 672 J1-5 Do you work on carbon microphones 0 1 15 4 2 43 10 6 12 3 0 0 0
J 673 J1-6 Do you work on capacitor microphones 0 1 5 1 2 4 3 3 2 2 0 0 0
J 674 J1-7 Do you work on crystal microphones 2 2 5 2 0 15 4 4 1 2 0 0 0
J 675 J1-8 Do you work on dynamic microphones 1 3 13 2 2 29 8 11 11 3 1 0 1
J 676 J1-9 Do you work on velocity ribbon microphones 0 1 2 0 0 6 3 1 1 2 0 0 0
J 677 J1-10 Do you trace block diagrams of circuits containing speakers 1 5 30 7 3 40 17 21 16 3 4 0 0
J 678 J1-11 Do you trace schematic diagrams of speaker circuits 1 4 18 6 3 25 13 15 10 3 3 0 0
J 679 J1-12 Do you troubleshoot to isolate a faulty speaker 2 4 24 7 3 34 14 15 16 4 3 0 0
J 680 J1-13 Do you troubleshoot speakers 0 2 12 2 3 9 6 5 5 3 2 0 0

0048 X 2. J2 Photosensitive Devices

J 681 J2-1 Do you trace block diagrams of circuits containing photosensitive devices 9 2 0 9 0 3 14 6 4 44 49 1 19
J 682 J2-2 Do you trace schematic diagrams of photosensitive device circuits 2 1 0 2 0 1 7 3 3 45 42 1 14
J 683 J2-3 Do you troubleshoot to isolate a faulty photosensitive device 6 1 0 5 0 1 7 3 3 38 47 0 12
J 684 J2-4 Do you adjust or calibrate photosensitive devices 1 0 0 2 0 0 1 1 0 29 21 2 7
J 685 J2-5 Do you work on photodiodes 1 1 0 0 0 1 2 1 1 38 23 0 9
J 686 J2-6 Do you work on phototransistors 1 0 0 0 0 0 1 1 0 21 12 0 5
J 687 J2-7 Do you work on phototubes 1 0 1 0 0 0 1 1 0 12 3 0 9
J 688 J2-8 Do you work on photo-SCRs 1 0 0 0 0 0 2 1 0 10 3 0 2

D
 T Task
 Y Nbr
 J 689 J2-9 Do you work on photocells (Photoconductive or Photovoltaic) 452 452 452 452 452 452 452 452 452 452 455 455 455 456
 52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0
 6 0 1 0 0 1 4 1 1 21 37 0 2

0049 X 3. J3 Storage Type Display Tubes

J 690 J3-1 Do you trace block diagrams of circuits containing display tubes 12 2 8 31 2 3 13 8 13 4 2 29 19
 J 691 J3-2 Do you trace schematic diagrams of display tubes or circuits 7 1 3 10 2 1 7 4 4 4 2 24 14
 J 692 J3-3 Do you troubleshoot to isolate a faulty display tube 8 1 6 20 0 3 8 4 3 3 3 25 14
 J 693 J3-4 Do you adjust or calibrate display tubes or circuits 4 0 3 5 2 0 3 1 2 3 0 19 12
 J 694 J3-5 Do you work on direct view storage tubes (DVST) 7 0 4 21 3 0 5 3 8 3 1 27 0
 J 695 J3-5 Do you work on multiple mode storage tubes (MMST) 7 0 3 2 0 0 7 2 3 2 0 0 0
 J 696 J3-7 Do you work on scan converter tubes (SCT) 4 0 4 8 0 0 2 3 2 1 0 16 19

0050 X 4. J4 Television, Laser, and Infrared Systems

J 697 J4-1 Do you trace block diagrams of TV systems or subassemblies 9 0 0 4 0 4 5 5 5 62 28 33 68
 J 698 J4-2 Do you trace schematic diagrams of TV systems or component circuits 7 0 0 3 0 1 3 4 2 61 29 26 64
 J 699 J4-3 Do you troubleshoot TV systems to major subassemblies 5 0 1 2 0 3 3 3 2 60 29 28 66
 J 700 J4-4 Do you troubleshoot TV systems to circuit level components 1 0 1 0 0 0 1 0 53 27 11 29
 J 701 J4-5 Do you adjust or calibrate TV systems or components 1 0 0 0 0 0 1 0 58 28 21 47
 J 702 J4-6 Do you trace block diagrams of laser systems or subassemblies 4 0 0 0 2 0 4 2 0 63 5 2 0
 J 703 J4-7 Do you trace schematic diagrams of laser systems or component circuits 2 0 0 0 0 0 3 2 0 60 5 1 1
 J 704 J4-8 Do you troubleshoot laser systems to major subassemblies 4 0 0 0 0 0 3 1 0 63 6 1 0
 J 705 J4-9 Do you troubleshoot laser systems to circuit level components 1 0 0 0 0 0 1 0 42 4 1 0
 J 706 J4-10 Do you adjust or calibrate laser systems or components 1 0 1 0 2 0 0 1 0 59 4 0 0
 J 707 J4-11 Do you trace block diagrams of infrared systems or subassemblies 5 0 1 2 0 12 4 4 7 63 34 1 81
 J 708 J4-12 Do you trace schematic diagrams of infrared systems or component circuits 4 0 0 0 0 7 3 3 3 62 29 1 75
 J 709 J4-13 Do you troubleshoot infrared systems to major subassemblies 5 0 2 0 0 9 2 3 6 64 32 3 82
 J 710 J4-14 Do you troubleshoot infrared systems circuit level components 1 0 1 0 0 1 0 1 1 57 12 1 35

Report Option Table for Modules

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Report Option Table for Tasks

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Description of Reported Module Factors

Col	Factor	Source vector	Title	Number Members	Mean	S.D.	Based on All Tasks Within Range	Min	Max	Valid
1	TITLE		Module Statement							

Description of Reported Task Factors

Col	Factor	Source vector	Title	Number Members	Mean	S.D.	Based on All Tasks Within Range	Min	Max	Valid
1	TITLE		Task Statement							
2	F0102	GP0142/PHP	All DAFSC 456X2A	29	18.16	26.31	100.00	.00		712
3	F0106	GP0149/PHP	All DAFSC 456X2B	19	12.69	20.08	100.00	.00		712
4	F0103	GP0144/PHP	All DAFSC 457X3A	28	12.36	17.57	92.86	.00		712
5	F0105	GP0146/PHP	All DAFSC 457X3C	19	12.43	19.01	100.00	.00		712
6	F0076	GP0079/PHP	All DAFSC 46150	1034	.82	3.24	34.82	.00		712
7	F0077	GP0080/PHP	All DAFSC 46250	1616	2.59	8.68	69.99	.00		712
8	F0078	GP0081/PHP	All DAFSC 46350	347	1.58	5.96	53.89	.00		712
9	F0079	GP0082/PHP	All Reporting Identifier 99104	144	29.41	22.62	93.75	.00		712
10	F0080	GP0083/PHP	All Reporting Identifier 99105	206	4.18	9.32	81.55	.00		712
11	F0081	GP0084/PHP	All Reporting Identifier 99106	119	2.47	7.29	75.63	.00		712

Electronic Principles Inventory (EPI) data for Air Force specialties is presented below in job inventory order. Data for this report was collected from job incumbents during the period March 1987 - April 1989

Percent members responding "YES" is shown for each specialty listed. Where skill level is not specified, both 5 and 7 skill levels are included (e.g., DAFSC 000X0 includes 00050 and 00070).

For assistance in using this EPI printout phone USAFOMC/OMYA, at AUTOVON 487-6623.

D	T Tsk	Task Title	456	456	457	457	461	462	463	991	991	991	991	991	991
Y Mbr			X2A	X2B	X3A	X3C	50	50	50	04	04	04	04	04	04

0001 EPI Electronic Principles Inventory

0002 1. General Electronic/Electricity

0003 1 1. A1 Direct/Alternating Current

A 1	A1-1 Do you use metric terms (example milli, kilo, mega)	55	53	68	89	17	19	45	87	82	76
A 2	A1-2 Do you use basic DC electrical/electronic terms	100	95	89	100	32	70	54	93	44	45
A 3	A1-3 Do you use basic AC electrical/electronic terms	100	95	86	100	30	61	52	94	43	45
A 4	A1-4 Do you trace schematic or block diagrams of circuits containing conductors, fuses, lamps, switches, or batteries	97	100	89	68	10	60	38	85	16	20
A 5	A1-5 Do you troubleshoot circuits containing conductors, fuses, lamps, switches, or batteries	97	100	79	58	16	62	39	80	11	18
A 6	A1-6 Do you calculate values of DC voltage, current, resistance, or power	38	47	29	16	12	16	8	61	8	8
A 7	A1-7 Do you calculate values of AC effective voltage, average voltage, or peak-to-peak voltage	48	47	29	16	3	11	3	59	6	6
A 8	A1-8 Do you calculate values of frequency, phase relationship, or wave length	48	58	21	26	1	5	2	55	15	5
A 9	A1-9 Do you trace schematic or block diagrams of circuits containing resistors	93	84	46	16	2	38	11	82	11	7
A 10	A1-10 Do you troubleshoot circuits to isolate a faulty resistor	59	42	29	5	2	32	10	69	4	6
A 11	A1-11 Do you calibrate or adjust circuits by using variable resistors	72	74	11	0	1	8	6	72	6	5
A 12	A1-12 Do you calculate the value of a resistor required for a circuit	21	11	4	0	2	9	2	41	2	5

D T Tsk Y Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	463 50	491 04	491 05	491 06
A 43	A1-43 Do you troubleshoot circuits to isolate a faulty three phase transformer	55	32	57	26	0	3	1	31	0	3	
A 44	A1-44 Do you adjust three phase transformers	21	21	11	5	0	1	1	15	0	2	

0004	I 2. A2 Electro/Mechanical Devices											
A 45	A2-1 Do you trace schematic or block diagrams of circuits containing DC motors	90	42	32	5	1	4	1	60	4	4	
A 46	A2-2 Do you troubleshoot circuits to isolate a faulty DC motor	83	42	29	5	1	4	1	56	2	3	
A 47	A2-3 Do you troubleshoot DC motor component parts	31	11	4	0	1	2	1	25	0	2	
A 48	A2-4 Do you perform tasks on DC motor component parts	17	0	4	0	1	2	1	28	0	2	
A 49	A2-5 Do you trace schematic or block diagrams of circuits containing AC motors	97	42	25	0	1	3	1	62	5	4	
A 50	A2-6 Do you troubleshoot circuits to isolate a faulty AC motor	93	37	21	0	1	3	1	56	2	2	
A 51	A2-7 Do you troubleshoot AC motor component parts	28	16	7	0	1	1	1	24	0	3	
A 52	A2-8 Do you perform tasks on AC motor component parts	21	0	4	0	1	1	1	28	0	3	
A 53	A2-9 Do you trace schematic or block diagrams of circuits containing DC generators	45	26	4	0	0	1	1	15	1	1	
A 54	A2-10 Do you troubleshoot to isolate a faulty DC generator	38	26	0	0	0	1	2	14	0	0	
A 55	A2-11 Do you troubleshoot DC generator component parts	14	21	0	0	0	1	1	11	0	0	
A 56	A2-12 Do you perform tasks on component parts of DC generators	14	5	0	0	0	1	1	11	0	0	
A 57	A2-13 Do you trace schematic or block diagrams of circuits containing AC generators	59	16	7	0	0	1	1	22	3	1	
A 58	A2-14 Do you troubleshoot circuits to isolate a faulty AC generator	52	16	4	0	0	1	1	21	1	0	
A 59	A2-15 Do you troubleshoot AC generator component parts	21	11	0	0	0	0	1	15	0	0	
A 60	A2-16 Do you perform tasks on component parts of AC generators	21	11	0	0	0	1	1	16	1	0	
A 61	A2-17 Do you trace schematic or block diagrams of circuits containing alternators	0	0	0	0	0	0	0	8	1	0	
A 62	A2-18 Do you troubleshoot circuits to isolate a faulty alternator	0	0	0	0	0	0	0	8	0	0	
A 63	A2-19 Do you troubleshoot alternator component parts	0	0	0	0	0	0	0	6	0	0	
A 64	A2-20 Do you perform tasks on component parts of alternators	0	0	0	0	0	0	0	6	0	0	
A 65	A2-21 Do you trace schematic or block diagrams of circuits containing synchros or servos	100	79	39	11	0	1	1	30	3	1	
A 66	A2-22 Do you troubleshoot circuits to isolate a faulty synchro or servo	100	95	32	11	1	1	1	28	0	1	
A 67	A2-23 Do you troubleshoot synchro or servo component parts	41	58	14	0	0	1	1	20	0	0	
A 68	A2-24 Do you perform tasks on component parts of synchros or servos	38	32	14	0	1	1	1	19	0	0	
A 69	A2-25 Do you trace schematic or block diagrams of circuits containing choppers	3	0	7	0	0	0	0	8	2	0	
A 70	A2-26 Do you troubleshoot circuits to isolate a faulty chopper	3	0	11	0	0	0	0	6	0	0	

PT	Task Title	456	457	457	461	462	463	991	991	991
T		X2A	X2B	X3A	X3C	50	50	50	04	05
Y										
Nbr										
A 71	A2-27 Do you measure chopper coil excitation frequency	3	0	4	0	0	0	0	6	0
A 72	A2-28 Do you measure chopper coil voltage-current phase relationship	3	0	4	0	0	0	0	4	0
A 73	A2-29 Do you trace schematic or block diagrams of circuits containing transducers	7	37	29	0	0	1	0	40	2
A 74	A2-30 Do you troubleshoot circuits to isolate a faulty transducer	10	37	14	0	1	1	0	37	0
A 75	A2-31 Do you calibrate or adjust transducers	3	11	7	0	2	1	0	37	0
A 76	A2-32 Do you repair, clean or lubricate transducers	7	16	7	0	1	1	0	38	0
A 77	A2-33 Do you trace schematic or block diagrams of circuits containing solenoids	79	47	29	0	1	36	13	49	4
A 78	A2-34 Do you troubleshoot circuits to isolate a faulty solenoid	76	47	21	0	1	37	17	44	2
A 79	A2-35 Do you perform maintenance on solenoid component parts	38	11	4	0	1	16	9	35	1
A 80	A2-36 Do you trace schematic or block diagrams of circuits containing meter movements	17	11	18	0	1	7	4	54	4
A 81	A2-37 Do you troubleshoot circuits to isolate a faulty meter movement	17	11	18	5	2	8	6	49	2
A 82	A2-38 Do you perform maintenance on meter movement mechanical parts	7	16	11	0	1	4	4	22	1

0005 I 3. A3 Solid State Circuits and Devices

A 83	A3-1 Do you trace schematic or block diagrams of circuits containing diodes	66	68	61	21	1	20	2	77	11	8
A 84	A3-2 Do you troubleshoot circuits to isolate a faulty diode	31	42	46	5	1	19	1	67	3	5
A 85	A3-3 Do you check diodes using an ohmmeter	34	53	43	0	1	18	1	70	2	4
A 86	A3-4 Do you use diode characteristic curves	3	11	4	0	0	1	0	35	1	1
A 87	A3-5 Do you use diode substitution information	3	5	7	0	0	2	0	49	2	3
A 88	A3-6 Do you use diode color codes	3	11	18	0	0	6	0	19	0	1
A 89	A3-7 Do you trace schematic or block diagrams of circuits containing transistors	55	63	29	16	1	9	2	78	10	4
A 90	A3-8 Do you troubleshoot circuits to isolate a faulty transistor	14	26	18	0	0	8	2	67	3	3
A 91	A3-9 Do you check transistors using an ohmmeter	14	32	11	0	1	6	3	64	2	2
A 92	A3-10 Do you check transistors using transistor testers	3	11	4	0	0	2	1	56	2	2
A 93	A3-11 Do you use transistor characteristic curves	0	5	4	0	0	0	0	35	1	1
A 94	A3-12 Do you use transistor substitution information	0	5	7	0	0	1	0	54	2	3
A 95	A3-13 Do you trace schematic or block diagrams of circuits containing integrated circuits (IC)	48	37	46	16	1	10	2	81	10	5
A 96	A3-14 Do you troubleshoot circuits to isolate a faulty IC	17	26	14	0	1	8	2	67	3	4
A 97	A3-15 Do you use IC substitution information	7	21	11	0	0	2	1	60	3	4
A 98	A3-16 Do you trace schematic or block diagrams of circuits containing solid-state special purpose devices	24	26	29	16	0	4	2	67	9	3
A 99	A3-17 Do you troubleshoot circuits to isolate a faulty solid-state special purpose device	14	16	25	0	0	3	2	60	2	3
A 100	A3-18 Do you perform tasks on varactors/varicaps	3	5	0	0	0	0	0	20	2	2
A 101	A3-19 Do you perform tasks on tunnel diodes	3	0	4	0	0	0	0	24	1	1

D Task Title
Y Nbr

A 137 A4-18 Do you troubleshoot to isolate a faulty CRT
A 138 A4-19 Do you adjust or calibrate circuits that control CRT operations
A 139 A4-20 Do you perform tasks on electrostatic CRT
A 140 A4-21 Do you perform tasks on electromagnetic CRT

0007 I 5. A5 Soldering or Solderless Connections

A 141 A5-1 Do you solder or desolder hardware connections
A 142 A5-2 Do you solder or desolder component connections such as resistors, capacitors, diodes, transformers, etc
A 143 A5-3 Do you solder or desolder printed circuit board connections
A 144 A5-4 Do you solder or desolder multi-layer circuit board connections
A 145 A5-5 Do you perform high reliability soldering
A 146 A5-6 Do you use crimping tool to repair or make connections
A 147 A5-7 Do you use wire wrap tool to make connections
A 148 A5-8 Do you use punch-on tool to make connections
A 149 A5-9 Do you repair or fabricate connectors or cables on multiconductor cables
A 150 A5-10 Do you repair or fabricate connectors or cables on coaxial cables
A 151 A5-11 Do you repair or fabricate connectors or cables on triaxial cables
A 152 A5-12 Do you repair or fabricate connectors or cables on ribbon cables

0008 II. Test Equipment

0009 II 1. B1 Multimeters

B 153 B1-1 Do you use the multimeter to measure DC voltage values
B 154 B1-2 Do you use the multimeter to measure AC voltage values
B 155 B1-3 Do you use the multimeter to extend the range of voltmeters using external shunts
B 156 B1-4 Do you use the multimeter to measure DC current values
B 157 B1-5 Do you use the multimeter to measure AC current values
B 158 B1-6 Do you use the multimeter to extend the range of ammeters using external shunts
B 159 B1-7 Do you use the multimeter to measure circuit resistance
B 160 B1-8 Do you use the multimeter to measure component resistance

D T Y	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	463 50	491 04	491 05	491 06
B 187	B4-3 Do you use field strength testers	7	0	0	5	0	1	0	12	1	3	
B 188	B4-4 Do you use digital multimeters	100	79	68	79	9	33	28	79	5	11	
B 189	B4-5 Do you use digital logic probes	3	11	4	16	0	1	1	57	2	0	
B 190	B4-6 Do you use capacitance testers	10	0	4	0	0	1	9	41	0	1	
B 191	B4-7 Do you use capacitor substitution boxes	3	0	0	0	0	0	0	16	0	0	
B 192	B4-8 Do you use DC restorers (CRT rejuvenators)	0	0	0	0	0	0	0	1	0	0	
B 193	B4-9 Do you use logic current tracers	0	0	0	21	0	0	0	33	0	1	
B 194	B4-10 Do you use tube testers	48	0	7	5	0	0	0	7	0	0	
B 195	B4-11 Do you use logic pulsers	3	0	0	11	0	0	1	46	1	0	
B 196	B4-12 Do you use logic analyzers	3	11	0	47	0	0	1	33	2	0	
B 197	B4-13 Do you use signature analyzers	10	0	0	5	0	0	0	15	0	0	
B 198	B4-14 Do you use reflectometers	34	5	14	47	0	1	0	15	0	0	

0013 III. Amplifier Circuits

0014 III 1. Cl Transistor Amplifier Circuits

C	Task Title	28	42	14	16	0	1	0	64	7	2
C 199	Cl-1 Do you trace block diagrams of circuits containing transistor amplifiers	28	42	14	16	0	1	0	64	7	2
C 200	Cl-2 Do you trace schematic diagrams of transistor amplifier circuits	24	21	11	5	0	0	0	65	6	1
C 201	Cl-3 Do you troubleshoot to isolate a faulty transistor amplifier	21	11	11	5	0	1	0	60	3	1
C 202	Cl-4 Do you troubleshoot transistor amplifiers to circuit level components	3	5	11	0	0	0	0	51	1	1
C 203	Cl-5 Do you troubleshoot transistor amplifier distortion	3	5	4	0	0	0	0	38	1	1
C 204	Cl-6 Do you adjust or align transistor amplifiers	7	16	7	0	0	0	0	47	2	1
C 205	Cl-7 Do you measure transistor amplifier voltage, current, or power gain	7	16	7	0	0	0	0	44	3	1
C 206	Cl-8 Do you calculate values of transistor amplifier voltage, current or power gain	3	5	4	0	0	0	0	34	1	1
C 207	Cl-9 Do you work on compound-connected (Darlington Pair) transistor amplifiers	3	16	0	5	0	0	0	45	2	1
C 208	Cl-10 Do you work on cascade-connected transistor amplifiers	3	16	4	5	0	0	0	41	2	0
C 209	Cl-11 Do you work on paraphase transistor amplifiers	3	11	0	0	0	0	0	13	1	0
C 210	Cl-12 Do you work on push-pull transistor amplifiers	7	16	7	0	0	0	0	53	2	1
C 211	Cl-13 Do you work on audio transistor amplifiers	0	11	0	0	0	0	0	35	2	0
C 212	Cl-14 Do you work on wideband transistor amplifiers	3	11	0	5	0	0	0	32	2	0
C 213	Cl-15 Do you work on IF transistor amplifiers	21	37	7	11	0	0	0	26	2	0
C 214	Cl-16 Do you work on RF transistor amplifiers	17	37	11	11	0	0	0	28	2	0
C 215	Cl-17 Do you work on buffer transistor amplifiers	7	16	7	5	0	0	0	49	1	0
C 216	Cl-18 Do you work on complementary symmetry transistor amplifiers	3	16	0	0	0	0	0	29	2	0
C 217	Cl-19 Do you work on DC transistor amplifiers (switching applications)	7	21	11	5	0	0	0	42	3	1

D	T	Task Title	456	456	457	457	461	462	463	991	991	991
Y	Nbr		X2A	X2B	X3A	X3C	50	50	50	04	05	06

0015 III 2. C2 Transistor Amplifier Stabilization Circuits

C 218	C2-1 Do you trace schematic diagrams of amplifier stabilization circuits	3	5	7	0	0	0	0	0	42	3	0
C 219	C2-2 Do you troubleshoot amplifier stabilization circuits to circuit level components	3	0	4	0	0	0	0	0	33	1	0
C 220	C2-3 Do you perform tasks on emitter (swamping) resistor stabilization amplifiers	3	11	0	0	0	0	0	0	42	0	0
C 221	C2-4 Do you perform tasks on self-bias stabilization amplifiers	7	0	0	0	0	0	0	0	36	0	0
C 222	C2-5 Do you perform tasks on thermistor stabilization amplifiers	0	11	4	0	0	0	0	0	28	0	0
C 223	C2-6 Do you perform tasks on diode stabilization amplifiers	7	11	4	0	0	0	0	0	38	0	0
C 224	C2-7 Do you perform tasks on double diode stabilization amplifiers	3	0	4	0	0	0	0	0	21	0	0

0016 III 3. C3 Coupling Circuits

C 225	C3-1 Do you trace block diagrams of circuits containing coupling circuits	10	21	14	16	0	1	0	0	57	3	1
C 226	C3-2 Do you trace schematic diagrams of coupling circuits	10	21	14	5	0	1	0	0	52	2	0
C 227	C3-3 Do you troubleshoot circuits to isolate a faulty coupling circuit	10	11	7	0	0	0	1	0	42	1	0
C 228	C3-4 Do you troubleshoot coupling circuits to circuit level components	3	5	0	0	0	0	0	0	40	1	0
C 229	C3-5 Do you perform tasks on direct coupling circuits	10	21	4	0	0	0	0	0	55	1	1
C 230	C3-6 Do you perform tasks on capacitive-resistive coupling circuits	7	11	4	0	0	0	0	0	47	1	1
C 231	C3-7 Do you perform tasks on capacitive-inductive coupling circuits	3	11	4	0	0	0	0	0	42	0	0
C 232	C3-8 Do you perform tasks on transformer coupling circuits	10	16	11	0	0	0	0	0	48	0	1
C 233	C3-9 Do you perform tasks on optical coupling circuits	0	11	0	0	0	0	0	0	20	0	0

0017 III 4. C4 Electron Tube Amplifier Circuits

C 234	C4-1 Do you trace block diagrams of circuits containing electron tube amplifiers	76	5	4	5	0	0	0	0	6	0	0
C 235	C4-2 Do you trace schematic diagrams of electron tube amplifiers	66	5	4	0	0	0	0	0	6	0	0
C 236	C4-3 Do you troubleshoot to isolate a faulty electron tube amplifier	62	5	4	0	0	0	0	0	5	0	0

[illegible]

0018 III 5. C5 Operational Amplifiers

C 249	C5-1 Do you trace block or schematic diagrams of circuits containing operational amplifiers (op amps)	21	26	14	21	0	0	0	69	7	3
C 250	C5-2 Do you troubleshoot to isolate a faulty op amp circuit	17	0	7	0	0	0	0	58	2	2
C 251	C5-3 Do you calculate op amp gain	0	0	0	0	0	0	0	33	1	0
C 252	C5-4 Do you adjust op amp bias, offsets, or drift	3	5	4	0	0	0	0	47	2	0
C 253	C5-5 Do you use or apply operational amplifiers for general purpose (inverting or non-inverting)	21	16	7	11	0	0	0	58	4	0
C 254	C5-6 Do you use or apply operational amplifiers as differential/comparators	7	16	4	11	0	0	0	52	3	0
C 255	C5-7 Do you use or apply operational amplifiers for summing	3	5	4	11	0	0	0	42	2	0
C 256	C5-8 Do you use or apply operational amplifiers for unity gain amplifier (buffer)	3	16	4	11	0	0	0	45	3	0
C 257	C5-9 Do you use or apply operational amplifiers as active filters	3	0	0	16	0	0	0	44	2	0
C 258	C5-10 Do you use or apply operational amplifiers as oscillators	7	21	4	16	0	0	0	42	2	0
C 259	C5-11 Do you use or apply operational amplifiers as integrators	3	16	4	11	0	0	0	28	1	0
C 260	C5-12 Do you use or apply operational amplifiers for differentiators	3	16	0	5	0	0	0	39	1	0
C 261	C5-13 Do you use or apply operational amplifiers for power supplies (voltage regulators)	24	16	11	5	1	0	1	54	4	2

D T Y	Task Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
D	281	DL-7 Do you perform tasks on full-wave rectifier power supplies	24	16	11	5	0	1	0	53	2	2
D	282	DL-8 Do you perform tasks on full-wave bridge rectifier power supplies	28	16	14	5	0	1	0	61	2	3
D	283	DL-9 Do you perform tasks on three-phase rectifier power supplies	17	16	7	5	0	1	1	25	1	1
D	284	DL-10 Do you perform tasks on voltage multipliers (doublers/triplers)	14	11	21	11	0	1	1	31	3	3
D	285	DL-11 Do you perform tasks on DC to DC converters	28	11	21	5	0	1	1	65	3	3
D	286	DL-12 Do you perform tasks on inverters (DC to AC converter?)	55	16	29	11	1	2	2	49	4	2
D	287	DL-13 Do you perform tasks on switching power supplies	3	0	7	5	0	3	3	44	3	2

0022 IV 2. D2 Power Supply Filters

D 288	D2-1 Do you trace block diagrams of circuits containing power supply filters	28	26	11	5	0	1	0	56	5	1
D 289	D2-2 Do you trace schematic diagrams of power supply filter's	24	16	11	0	0	1	0	56	3	1
D 290	D2-3 Do you troubleshoot circuits to isolate a faulty power supply filter	17	16	11	0	0	1	0	47	1	2
D 291	D2-4 Do you troubleshoot power supply filters to circuit level components	7	5	4	0	0	1	0	40	1	1
D 292	D2-5 Do you perform tasks on capacitive power supply filters	14	5	7	5	0	0	0	51	2	1
D 293	D2-6 Do you perform tasks on inductive power supply filters	7	0	7	5	0	0	0	40	1	0
D 294	D2-7 Do you perform tasks on L-type power supply filters	3	0	4	5	0	0	0	24	1	0
D 295	D2-8 Do you perform tasks on Pi-type power supply filters	3	0	0	5	0	0	0	22	1	0
D 296	D2-9 Do you perform tasks on T-type power supply filters	3	0	0	5	0	0	0	19	1	0
D 297	D2-10 Do you perform tasks on resistive capacitive (RC) power supply filters	14	0	7	5	0	0	0	46	2	1
D 298	D2-11 Do you perform tasks on inductive capacitive (LC) power supply filters	7	0	7	5	0	0	0	42	1	0

IV 3. D3 Power Supply Voltage Regulators
0023

D 299	D3-1 Do you trace block diagrams of circuits containing power supply voltage regulators	69	32	25	5	0	2	1	69	5	3
D 300	D3-2 Do you trace schematic diagrams of power supply voltage regulator circuits	62	21	25	0	0	2	1	66	4	1
D 301	D3-3 Do you troubleshoot circuits to isolate a faulty power supply voltage regulator	69	16	25	0	0	2	1	58	2	1
U 302	D3-4 Do you troubleshoot power supply voltage regulators to circuit level components	24	5	7	0	0	1	0	50	1	0
D 303	D3-5 Do you perform tasks on variable resistor power supply voltage regulators	59	11	4	5	0	1	1	53	2	0

D T Y	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
E 323	E2-7 Do you perform tasks on high pass frequency sensitive filters	3	5	4	11	0	0	0	41	4	0
E 324	E2-8 Do you perform tasks on band pass frequency sensitive filters	7	0	4	11	0	0	0	51	4	0
E 325	E2-9 Do you perform tasks on band-reject frequency sensitive filters	3	0	4	11	0	0	0	29	2	0
E 326	E2-10 Do you perform tasks on ferrite bead frequency sensitive filters	3	0	0	5	0	0	0	8	1	0

0027 VI. Waveshaping/Generating Circuits

0028 VI 1. Fl Oscillators

F	Task Title	55	32	11	16	0	0	0	0	56	4	0
F 327	Fl-1 Do you trace block diagrams of circuits containing oscillators	55	32	11	16	0	0	0	0	56	4	0
F 328	Fl-2 Do you trace schematic diagrams of oscillator circuits	38	16	11	11	0	0	0	0	54	2	0
F 329	Fl-3 Do you troubleshoot to isolate a faulty oscillator circuit	45	16	11	0	0	0	0	0	47	1	0
F 330	Fl-4 Do you troubleshoot oscillators to circuit level components	24	0	4	0	0	0	0	0	35	1	0
F 331	Fl-5 Do you align or adjust oscillator circuits	41	16	7	0	0	0	0	0	52	2	0
F 332	Fl-6 Do the oscillators you work with use LC tank circuits	3	0	4	5	0	0	0	0	33	2	0
F 333	Fl-7 Do the oscillators you work with use RC networks	21	0	7	5	0	0	0	0	40	2	0
F 334	Fl-8 Do the oscillators you work with use crystals	66	26	7	5	0	0	0	0	52	2	1
F 335	Fl-9 Do the oscillators you work with use phase lock loops (PLL)	3	0	4	5	0	0	0	0	38	2	0
F 336	Fl-10 Do you perform tasks on series Hartley oscillator circuits	0	0	4	0	0	0	0	0	21	1	0
F 337	Fl-11 Do you perform tasks on shunt Hartley oscillator circuits	0	0	4	0	0	0	0	0	22	2	0
F 338	Fl-12 Do you perform tasks on Colpitts oscillator circuits	3	0	0	0	0	0	0	0	21	2	0
F 339	Fl-13 Do you perform tasks on Clapp oscillator circuits	0	0	0	5	0	0	0	0	15	1	0
F 340	Fl-14 Do you perform tasks on voltage control oscillators (VCO/VTD)	10	16	11	16	0	0	0	0	42	2	0
F 341	Fl-15 Do you perform tasks on crystal oscillator circuits	45	16	4	0	0	0	0	0	46	2	0
F 342	Fl-16 Do you perform tasks on Wien Bridge oscillator circuits	0	0	0	5	0	0	0	0	13	1	0
F 343	Fl-17 Do you perform tasks on pulse generating oscillator circuits	24	0	0	5	0	0	0	0	22	2	0
F 344	Fl-18 Do you perform tasks on blocked/blocking oscillator circuits	17	0	0	5	0	0	0	0	7	1	0
F 345	Fl-19 Do you perform tasks on burst generators	0	0	0	0	0	0	0	0	5	1	0
F 346	Fl-20 Do you perform tasks on RC phase shift oscillators	1	0	0	5	0	0	0	0	15	1	0

D Task Title
 Y Nbr 456 456 457 457 461 462 463 991 991 991
 X2A X2B X3A X3C 50 50 50 04 05 06

0029 VI 2. F2 Multivibrators

F 347 F2-1 Do you trace block diagrams of circuits containing multivibrators 45 16 4 11 0 0 0 42 3 0
 F 348 F2-2 Do you trace schematic diagrams of multivibrator circuits 45 5 4 0 0 0 0 42 2 0
 F 349 F2-3 Do you troubleshoot to isolate a faulty multivibrator circuit 41 0 0 0 0 0 0 38 1 0
 F 350 F2-4 Do you troubleshoot multivibrators to circuit level components 10 0 0 0 0 0 0 31 1 0
 F 351 F2-5 Do you adjust or align multivibrator circuits 21 5 4 0 0 0 0 35 0 0
 F 352 F2-6 Do the multivibrators you work with use LC tank circuits 10 0 0 5 0 0 0 25 1 0
 F 353 F2-7 Do the multivibrators you work with use RC networks 17 0 4 5 0 0 0 36 2 0
 F 354 F2-8 Do the multivibrators you work with use Crystals 17 11 4 5 0 0 0 31 1 0
 F 355 F2-9 Do you perform tasks on astable (free running) multivibrators 24 0 0 5 0 0 0 34 2 0
 F 356 F2-10 Do you perform tasks on monostable (one shot) multivibrators 10 11 4 5 0 0 0 35 2 0
 F 357 F2-11 Do you perform tasks on bistable (flip flop) multivibrators 10 5 4 5 0 0 0 38 3 0
 F 358 F2-12 Do you perform tasks on triggered astable multivibrators 7 5 4 5 0 0 0 28 2 0

0030 VI 3. F3 Waveshaping Circuits

F 359 F3-1 Do you trace block diagrams of circuits containing waveshaping circuits (WSC) 24 16 4 21 0 0 0 31 2 0
 F 360 F3-2 Do you trace schematic diagrams of WSC 17 11 4 5 0 0 0 32 1 0
 F 361 F3-3 Do you troubleshoot to isolate a faulty WSC 24 11 0 0 0 0 0 26 0 0
 F 362 F3-4 Do you troubleshoot WSC to circuit level components 10 0 0 0 0 0 0 22 0 0
 F 363 F3-5 Do you adjust or calibrate WSC 21 16 0 0 0 0 0 25 1 0
 F 364 F3-6 Do you perform tasks on sawtooth wave generator WSC 24 11 4 11 0 0 0 24 2 0
 F 365 F3-7 Do you perform tasks on trapezoidal (ramp) wave generator WSC 7 0 0 11 0 0 0 24 1 0
 F 366 F3-8 Do you perform tasks on RC differentiating WSC 3 0 0 5 0 0 0 21 1 0
 F 367 F3-9 Do you perform tasks on RL differentiating WSC 3 0 0 5 0 0 0 14 1 0
 F 368 F3-10 Do you perform tasks on RC integrating WSC 3 0 0 5 0 0 0 20 1 0
 F 369 F3-11 Do you perform tasks on RL integrating WSC 3 0 0 5 0 0 0 14 1 0
 F 370 F3-12 Do you perform tasks on square wave generator WSC 28 11 4 11 0 0 0 30 1 0
 F 371 F3-13 Do you perform tasks on rectangular wave generator WSC 10 5 0 11 0 0 0 22 1 0
 F 372 F3-14 Do you perform tasks on Schmitt trigger WSC 14 0 4 5 0 0 0 31 1 0

D	Tsk	Y Nbr	Task Title	456	456	457	457	461	462	463	991	991	991	991
				X2A	X2B	X3A	X3C	50	50	50	04	05	06	

0031 VI 4. F4 Limiter/Clamper Circuits

F 373	F4-1 Do you trace block diagrams of circuits containing limiters	10	11	0	16	0	0	0	0	0	35	2	0
F 374	F4-2 Do you trace schematic diagrams of limiter circuits	7	5	0	5	0	0	0	0	0	35	2	0
F 375	F4-3 Do you trace block diagrams of circuits containing clamper	7	5	0	11	0	0	0	0	0	32	2	0
F 376	F4-4 Do you trace schematic diagrams of clamper circuits	0	5	0	0	0	0	0	0	0	31	2	0
F 377	F4-5 Do you troubleshoot to isolate a faulty limiter circuit	10	0	0	5	0	0	0	0	0	31	0	0
F 378	F4-6 Do you troubleshoot limiters to circuit level components	3	0	0	0	0	0	0	0	0	25	0	0
F 379	F4-7 Do you troubleshoot to isolate a faulty clamper circuit	3	0	0	0	0	0	0	0	0	29	0	0
F 380	F4-8 Do you troubleshoot clamper to circuit level components	0	0	0	0	0	0	0	0	0	23	0	0
F 381	F4-9 Do you perform tasks on series diode limiter circuits	7	0	0	5	0	0	0	0	0	25	1	0
F 382	F4-10 Do you perform tasks on shunt diode limiter circuits	0	0	0	5	0	0	0	0	0	26	1	0
F 383	F4-11 Do you perform tasks on bias limiter circuits	3	0	0	5	0	0	0	0	0	21	1	0
F 384	F4-12 Do you perform tasks on zener diode circuits	10	11	0	5	0	0	0	0	0	30	1	1
F 385	F4-13 Do you perform tasks on transistor limiter circuits	10	0	0	5	0	0	0	0	0	26	1	0
F 386	F4-14 Do you perform tasks on triode limiter circuits	7	0	0	5	0	0	0	0	0	10	0	0
F 387	F4-15 Do you perform tasks on diode clamper circuits	7	0	0	5	0	0	0	0	0	28	0	0
F 388	F4-16 Do you perform tasks on bias clamper circuits	0	5	0	5	0	0	0	0	0	19	1	0

0032 VII. Computers, Digital Circuits, and Devices

0033 VII 1. G1 Digital Logic Numbering Systems and Functions

G 389	G1-1 Do you convert decimal numbers to binary numbers or binary numbers to decimal	0	26	50	42	0	2	1	56	32	11
G 390	G1-2 Do you convert octal numbers to binary or binary numbers to octal	0	11	29	32	0	1	0	39	24	6
G 391	G1-3 Do you convert hexadecimal numbers to binary or binary numbers to hexadecimal	0	16	50	47	1	1	0	53	32	9
G 392	G1-4 Do you convert octal numbers to decimal or decimal numbers to octal	0	11	25	32	0	1	0	37	24	6
G 393	G1-5 Do you convert hexadecimal numbers to decimal or decimal numbers to hexadecimal	0	21	54	42	0	1	0	52	35	9
G 394	G1-6 Do you convert octal numbers to hexadecimal or hexadecimal numbers to octal	0	11	25	32	0	0	0	33	19	5
G 395	G1-7 Do you convert base number fractions to another base numbering system	0	11	18	26	0	1	1	27	14	6
G 396	G1-8 Do you add binary numbers	0	11	29	26	0	2	1	47	21	10

D	T	Task Title	456	456	457	457	461	462	463	991	991	991
Y	Nbr		X2A	X2B	X3A	X3C	50	50	50	04	05	06
G 435		G1-47 Do you develop Boolean equations from logic circuits or diagrams	0	0	14	0	0	0	0	26	2	0
G 436		G1-48 Do you develop logic diagrams from Boolean equations	0	0	14	0	0	0	0	24	1	0
G 437		G1-49 Do you simplify Boolean expressions using Boolean algebra	0	0	11	0	0	0	0	24	2	1
G 438		G1-50 Do you perform tasks on RTL (resistor transistor logic formally DCTL)	0	0	7	5	0	0	0	25	2	0
G 439		G1-51 Do you perform tasks on DTL (diode transistor logic)	0	0	7	5	0	0	0	31	2	0
G 440		G1-52 Do you perform tasks on TTL (transistor transistor logic)	3	5	14	5	0	0	0	58	3	0
G 441		G1-53 Do you perform tasks on ECL/CHL (emitter coupled or current mode logic)	0	0	11	5	0	0	0	18	2	0
G 442		G1-54 Do you perform tasks on HTL (high threshold logic)	0	0	0	5	0	0	0	14	1	0
G 443		G1-55 Do you perform tasks on CMOS (complementary metal oxide semiconductor)	0	0	11	5	0	0	0	53	2	0
G 444		G1-56 Do you perform tasks on positive MOS ICs	0	0	4	5	0	0	0	17	1	0
G 445		G1-57 Do you perform tasks on negative MOS ICs	0	0	4	5	0	0	0	17	1	0
G 446		G1-58 Do you perform tasks on vertical MOS ICs	0	0	0	5	0	0	0	8	1	0

0034 VII 2. G2 Computers

G 447	G2-1 Do you trace block or schematic diagrams of computer controlled or computer based systems	14	16	68	63	1	2	1	65	18	10
G 448	G2-2 Do you load programs	0	21	82	79	8	5	9	71	65	48
G 449	G2-3 Do you write or debug programs	0	5	11	0	2	1	3	36	30	26
G 450	G2-4 Do you troubleshoot computers to a major unit	10	16	64	68	1	1	2	63	23	13
G 451	G2-5 Do you troubleshoot computers to a subassembly or circuit card	17	21	36	0	0	1	1	62	7	3
G 452	G2-6 Do you troubleshoot computer subassembly or circuit card to circuit level components or IC	3	5	4	0	0	0	1	42	2	1
G 453	G2-7 Do you use computer flow charts or diagrams	0	11	54	32	2	2	3	56	27	18
G 454	G2-8 Do you perform tasks on analog computers	38	5	14	21	3	2	3	20	19	6
G 455	G2-9 Do you perform tasks on digital computers	24	16	89	68	3	3	3	74	67	39
G 456	G2-10 Do you use Basic computer language	3	0	18	0	9	4	9	31	32	35
G 457	G2-11 Do you use COBOL computer language	0	0	4	0	1	0	0	2	1	3
G 458	G2-12 Do you use FORTRAN computer language	0	0	11	0	1	0	1	8	24	30
G 459	G2-13 Do you use ADA computer language	0	0	0	0	0	0	0	2	10	6
G 460	G2-14 Do you use ILAS computer language	0	0	0	11	0	0	1	0	0	0
G 461	G2-15 Do you use ELAN computer language	0	0	0	0	0	0	0	0	0	0
G 462	G2-16 Do you use ASCAL computer language	0	0	0	5	1	0	0	3	9	9
G 463	G2-17 Do you use RPG computer language	0	0	0	0	0	0	0	0	1	1
G 464	G2-18 Do you use Machine computer language	0	0	4	11	1	0	2	37	12	8
G 465	G2-19 Do you use computer language	0	0	0	0	1	0	0	2	13	4
G 466	G2-20 Do you perform tasks on magnetic (tape, disc, core) computer memories	0	16	68	53	9	4	6	67	67	47
G 467	G2-21 Do you perform tasks on semiconductor (RAM, ROM, EPROM, PROM) computer memories	0	0	54	42	3	1	3	65	35	24

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
G	468	G2-22 Do you perform tasks on paper (tape, punch card) computer memories	0	16	21	5	2	1	1	13	28	9
G	469	G2-23 Do you perform tasks on advanced technology (bubble, CCD, electron beam, laser, thin film) computer memories	0	0	7	5	0	0	1	24	7	2
G	470	G2-24 Do you perform tasks on computer keyboards	0	16	61	58	15	9	14	70	72	61
G	471	G2-25 Do you perform tasks on computer character printers	0	5	39	5	9	4	10	58	46	43
G	472	G2-26 Do you perform tasks on magnetic tape drives	0	5	46	16	3	1	2	65	54	36
G	473	G2-27 Do you perform tasks on microprocessor computer terminals	0	5	29	5	6	1	5	49	52	45
G	474	G2-28 Do you perform tasks on video display unit (VDU/monitors)	0	5	43	47	8	4	7	39	50	42
G	475	G2-29 Do you perform tasks on paper tape readers/punches	0	5	14	5	1	0	1	8	31	3
G	476	G2-30 Do you perform tasks on paper card readers/punches	0	0	4	0	0	0	0	3	7	1
G	477	G2-31 Do you perform tasks on toggle or push button switch inputs	0	0	39	32	2	2	3	47	34	9
G	478	G2-32 Do you perform tasks on incandescent displays (Nixie tubes, LEDs, LCDs)	0	5	36	11	1	1	1	42	19	8
G	479	G2-33 Do you perform tasks on modems	0	0	14	11	4	2	4	41	36	13
G	480	G2-34 Do you perform tasks on line printers	0	0	21	5	9	4	9	44	45	42
G	481	G2-35 Do you perform tasks on floppy disc drives	0	0	21	5	12	4	10	39	59	53
G	482	G2-36 Do you perform tasks on removable cartridge disc drives	0	0	18	0	3	1	3	18	32	24
G	483	G2-37 Do you perform tasks on removable pack disc drives	0	0	4	0	2	0	1	43	33	14
G	484	G2-38 Do you perform tasks on fixed Winchester type disc drives	0	0	7	0	4	1	2	28	23	23
G	485	G2-39 Do you trace block or schematic diagrams of microprocessor controlled systems	0	5	29	21	0	0	0	53	7	3
G	486	G2-40 Do you troubleshoot microprocessor controlled systems to a subassembly or circuit card	0	5	11	0	0	0	0	47	4	3
G	487	G2-41 Do you troubleshoot microprocessor controlled systems to isolate a faulty microprocessor	0	0	4	0	0	0	0	35	1	2
0035		VII 3. G3 Digital Circuits										
G	488	G3-1 Do you trace data flow through circuits containing counters	3	5	18	5	0	0	0	50	6	0
G	489	G3-2 Do you troubleshoot counter circuits to isolate a faulty counter	3	5	14	0	0	1	0	43	2	0
G	490	G3-3 Do you troubleshoot counters to circuit level components	0	0	4	0	0	0	0	36	2	0
G	491	G3-4 Do you perform tasks on UP counters in logic circuits	3	5	11	5	0	0	0	42	5	0
G	492	G3-5 Do you perform tasks on DOWN counters in logic circuits	3	5	11	5	0	0	0	40	4	0
G	493	G3-6 Do you perform tasks on DECADE counters in logic circuits	0	0	11	5	0	0	0	39	3	0
G	494	G3-7 Do you perform tasks on ring counters in logic circuits	0	0	11	5	0	0	0	22	2	0

Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	463 50	463 50	491 04	491 05	491 06
G 495 G3-8 Do you perform tasks on modulus counters in logic circuits	0	0	4	0	0	0	0	0	13	2	0	0
G 496 G3-9 Do you perform tasks on synchronous (parallel) counters in logic circuits	3	0	4	5	0	0	0	0	38	2	0	0
G 497 G3-10 Do you perform tasks on asynchronous (serial) counters in logic circuits	3	0	4	5	0	0	0	0	39	2	0	0
G 498 G3-11 Do you trace logic diagrams of circuits containing registers	0	0	21	5	0	0	0	0	48	5	0	0
G 499 G3-12 Do you troubleshoot circuits containing registers to isolate a faulty register	0	0	18	0	0	0	0	0	38	1	0	0
G 500 G3-13 Do you troubleshoot registers to circuit level components	0	0	4	0	0	0	0	0	31	1	0	0
G 501 G3-14 Do you perform tasks on shift registers in logic circuits	0	0	21	5	0	0	0	0	42	4	0	0
G 502 G3-15 Do you perform tasks on storage registers in logic circuits	0	0	14	5	0	0	0	0	44	5	0	0
G 503 G3-16 Do you trace data flow through combinational logic circuits	3	11	29	5	0	0	0	0	44	4	1	0
G 504 G3-17 Do you troubleshoot to isolate a faulty combinational logic circuit	3	11	25	0	0	0	0	0	39	1	0	0
G 505 G3-18 Do you troubleshoot combinational logic circuits to circuit level components	0	5	4	0	0	0	0	0	33	0	0	0
G 506 G3-19 Do you perform tasks on encoders	0	0	21	5	1	0	1	0	40	2	0	0
G 507 G3-20 Do you perform tasks on decoders	0	0	21	5	1	0	1	0	39	2	0	0
G 508 G3-21 Do you perform tasks on multiplexers	0	11	32	5	0	0	0	0	45	3	1	1
G 509 G3-22 Do you perform tasks on demultiplexers	0	5	29	5	0	0	0	0	40	2	1	1
G 510 G3-23 Do you perform tasks on comparators	3	5	21	5	0	0	0	0	40	2	0	0
G 511 G3-24 Do you perform tasks on parity generators or checkers	0	5	25	5	0	0	0	0	37	2	0	0
G 512 G3-25 Do you perform tasks on code converters	0	0	11	5	0	0	0	0	21	1	0	0
G 513 G3-26 Do you perform tasks on adders	0	5	14	5	0	0	0	0	32	1	0	0
G 514 G3-27 Do you perform tasks on subtractors	0	5	14	5	0	0	0	0	30	1	0	0
G 515 G3-28 Do you perform tasks on count detect circuits	0	0	11	5	0	0	0	0	26	2	1	0

0036 VII 4. G4 Digital to Analog (D/A) and Analog to Digital (A/D) Converters

G 516 G4-1 Do you trace data flow through A/D converters	7	11	36	11	0	0	0	0	57	11	3	3
G 517 G4-2 Do you trace data flow through D/A converters	7	11	36	11	0	0	0	0	57	8	2	2
G 518 G4-3 Do you troubleshoot A/D converter circuits	10	5	29	0	0	0	0	0	49	2	1	1
G 519 G4-4 Do you troubleshoot D/A converter circuits	10	5	29	0	0	0	0	0	51	2	1	1
G 520 G4-5 Do the converters you perform tasks on use flash conversion	0	0	7	0	0	0	0	0	5	1	2	0
G 521 G4-6 Do the converters you perform tasks on use successive approximation conversion	0	0	7	0	0	0	0	0	44	3	3	3
G 522 G4-7 Do the converters you perform tasks on use ramp conversion	3	0	7	5	0	0	0	0	31	3	1	1
G 523 G4-8 Do the converters you perform tasks on use R2R conversion	0	5	11	0	0	0	0	0	15	1	0	0

D	T	Task	Task Title	456	456	457	457	461	462	463	991	991	991
Y	Nbr			X2A	X2B	X3A	X3C	50	50	50	04	05	06

0037 VIII. Transmission/Reception Circuits, Devices, and Systems

0038 VIII 1. H1 Connections

H 524	H1-1	Do you measure electrical length on transmission lines	3	0	18	26	0	0	0	0	15	1	0
H 525	H1-2	Do you measure physical length on transmission lines	7	0	7	47	0	0	0	0	22	2	0
H 526	H1-3	Do you measure standing wave ratio (SWR) on transmission lines	0	0	14	32	0	0	0	0	15	0	0
H 527	H1-4	Do you construct transmission lines	7	0	7	26	0	0	0	0	15	1	0
H 528	H1-5	Do you match transmission line impedance with loads	10	0	7	26	0	0	0	0	15	0	0
H 529	H1-6	Do you calculate the characteristic impedance (ZO) of transmission lines	0	0	7	0	0	0	0	0	10	0	0
H 530	H1-7	Do you troubleshoot transmission lines	21	0	21	63	0	0	0	0	38	3	1
H 531	H1-8	Do you perform tasks on open-wire transmission lines	7	5	11	32	0	0	0	0	17	2	0
H 532	H1-9	Do you perform tasks on twisted pair transmission lines	14	5	36	37	0	1	0	0	29	2	0
H 533	H1-10	Do you perform tasks on twin lead transmission lines	3	5	0	32	0	0	0	0	9	2	0
H 534	H1-11	Do you perform tasks on flexible coaxial transmission lines	21	5	25	74	0	1	1	1	33	2	0
H 535	H1-12	Do you perform tasks on rigid coaxial transmission lines	3	5	7	53	0	0	0	0	11	1	0
H 536	H1-13	Do you perform tasks on fiber-optic transmission lines	0	0	0	5	0	0	0	1	8	2	0
H 537	H1-14	Do you trace schematic or block diagrams of circuits containing waveguides	86	53	32	74	0	0	0	0	4	1	0
H 538	H1-15	Do you troubleshoot circuits to isolate a faulty waveguide assembly	86	63	32	74	0	0	0	0	3	0	0
H 539	H1-16	Do you pressurize or purge waveguide assemblies	76	63	32	63	0	0	0	0	2	0	0
H 540	H1-17	Do you measure standing wave ratio for waveguide assemblies	7	5	14	37	0	0	0	0	3	0	0
H 541	H1-18	Do you remove or install waveguide or associated coupling hardware components	90	42	39	84	2	0	0	0	3	0	0

0039 VIII 2. H2 Microwave Oscillators and Amplifiers

H 542	H2-1	Do you trace schematic or block diagrams of circuits containing microwave oscillators or amplifiers	55	32	7	21	0	0	0	0	4	2	0
H 543	H2-2	Do you troubleshoot circuits to isolate a faulty microwave oscillator or amplifier	48	32	7	5	0	0	0	0	4	0	0
H 544	H2-3	Do you tune or adjust microwave oscillators or amplifiers	48	32	4	0	0	0	0	0	5	0	0
H 545	H2-4	Do you perform tasks on two-cavity klystron microwave oscillators and amplifiers	14	5	0	0	0	0	0	0	0	0	0

D T Y Task Nbr Task Title 456 456 457 457 461 462 463 991 991 991
 X2A X2B X3A X3C 50 50 50 04 05 06

H 546 H2-5 Do you perform tasks on three-cavity klystron 10 0 4 0 0 0 0 0 0 0
 microwave oscillators and amplifiers
 H 547 H2-6 Do you perform tasks on reflex klystron 41 0 0 0 0 0 0 1 0 0
 microwave oscillators and amplifiers
 H 548 H2-7 Do you perform tasks on traveling wave tube 0 0 7 5 0 0 0 1 0 0
 microwave oscillators and amplifiers
 H 549 H2-8 Do you perform tasks on magnetron 55 32 7 0 0 0 0 1 0 0
 microwave oscillators and amplifiers
 H 550 H2-9 Do you perform tasks on backward wave oscillator 0 0 0 0 0 0 0 1 0 0
 H 551 H2-10 Do you perform tasks on parametric amplifiers 0 5 0 5 0 0 0 0 0 0
 H 552 H2-11 Do you perform tasks on yttrium iron garnet (YIG) 0 0 0 5 0 0 0 0 0 0
 tuned microwave oscillators and amplifiers

VIII 3. H3 Resonant Cavities

H 553 H3-1 Do you trace schematic or block diagrams of 48 21 11 11 0 0 0 5 0 0
 circuits containing resonant cavities
 H 554 H3-2 Do you troubleshoot circuits to isolate a 41 21 11 0 0 0 0 3 0 0
 faulty resonant cavity
 H 555 H3-3 Do you tune or adjust resonant cavities electrically 34 16 11 0 0 0 0 4 0 0
 H 556 H3-4 Do you tune or adjust resonant cavities physically 59 16 4 0 0 0 0 4 0 0
 H 557 H3-5 Do you measure frequency of resonant cavities 34 21 7 5 0 0 0 3 0 0
 H 558 H3-6 Do you perform tasks on probe resonant cavities 7 5 4 5 0 0 0 1 0 0
 H 559 H3-7 Do you perform tasks on loop resonant cavities 3 0 0 5 0 0 0 1 0 0
 H 560 H3-8 Do you perform tasks on aperture (iris/window) 10 0 4 5 0 0 0 1 0 0
 resonant cavities

VIII 4. H4 Transmitters and Receivers

H 561 H4-1 Do you use "AM" modulation principles 3 0 0 26 0 0 0 6 2 0
 H 562 H4-2 Do you trace block diagrams of AM transmitters 3 0 0 37 0 0 0 7 1 0
 H 563 H4-3 Do you trace block diagrams of AM transmitter 7 0 0 5 0 0 0 7 0 0
 subassemblies or circuit cards
 H 564 H4-4 Do you trace schematic diagrams of AM transmitter 7 0 0 5 0 0 0 8 0 0
 subassemblies or circuit cards
 H 565 H4-5 Do you troubleshoot AM transmitters to major units 3 0 0 32 0 0 0 4 0 0
 H 566 H4-6 Do you troubleshoot AM transmitters to 3 0 0 0 0 0 0 5 0 0
 subassemblies or circuit cards
 H 567 H4-7 Do you troubleshoot AM transmitter subassemblies 3 0 0 0 0 0 0 4 0 0
 or circuit cards to circuit level components
 H 568 H4-8 Do you align or adjust AM transmitters or circuits 3 0 0 0 0 0 0 5 0 0
 H 569 H4-9 Do you calculate percentage of modulation for 3 0 0 0 0 0 0 6 0 0
 AM transmitters
 H 570 H4-10 Do you use "AM" demodulation principles 3 0 0 32 0 0 0 10 2 0
 H 571 H4-11 Do you trace block diagrams of AM receivers 3 0 0 37 0 0 0 13 2 0

PTMCD	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
H 572	H 572	H4-12 Do you trace block diagrams of AM receiver subassemblies or circuit cards	3	0	0	5	0	0	0	13	1	0
H 573	H 573	H4-13 Do you trace schematic diagrams of AM receiver subassemblies or circuit cards	3	0	0	5	0	0	0	12	1	0
H 574	H 574	H4-14 Do you troubleshoot AM receivers to major units	3	0	0	26	0	0	0	9	0	0
H 575	H 575	H4-15 Do you troubleshoot AM receivers to subassemblies or circuit cards	3	0	0	0	0	0	0	8	0	0
H 576	H 576	H4-16 Do you troubleshoot AM receiver subassemblies or circuit cards to circuit level components	3	0	0	0	0	0	0	6	0	0
H 577	H 577	H4-17 Do you align or adjust AM receivers or circuits	3	0	0	0	0	0	0	12	2	0
H 578	H 578	H4-18 Do you trace block diagrams of single side band (SSB) transmitters	0	0	0	16	0	0	0	2	0	0
H 579	H 579	H4-19 Do you trace block diagrams of SSB transmitter subassemblies or circuit cards	0	0	0	5	0	0	0	2	0	0
H 580	H 580	H4-20 Do you trace schematic diagrams of SSB transmitter subassemblies or circuit cards	0	0	0	5	0	0	0	2	0	0
H 581	H 581	H4-21 Do you troubleshoot SSB transmitters to major units	0	0	0	16	0	0	0	1	0	0
H 582	H 582	H4-22 Do you troubleshoot SSB transmitters to subassemblies or circuit cards	0	0	0	0	0	0	0	1	0	0
H 583	H 583	H4-23 Do you troubleshoot SSB transmitter subassemblies or circuit cards to circuit level components	0	0	0	0	0	0	0	1	0	0
H 584	H 584	H4-24 Do you align or adjust SSB transmitters or circuits	0	0	0	11	0	0	0	1	0	0
H 585	H 585	H4-25 Do you calculate percentage of modulation for SSB transmitters	0	0	0	0	0	0	0	2	0	0
H 586	H 586	H4-26 Do you trace block diagrams of SSB receivers	0	0	0	16	0	0	0	3	1	0
H 587	H 587	H4-27 Do you trace block diagrams of SSB receiver subassemblies or circuit cards	0	0	0	0	0	0	0	3	1	0
H 588	H 588	H4-28 Do you trace schematic diagrams of SSB receiver subassemblies or circuit cards	0	0	0	0	0	0	0	3	1	0
H 589	H 589	H4-29 Do you troubleshoot SSB receivers to major units	0	0	0	16	0	0	0	2	0	0
H 590	H 590	H4-30 Do you troubleshoot SSB receivers to subassemblies or circuit cards	0	0	0	0	0	0	0	2	0	0
H 591	H 591	H4-31 Do you troubleshoot SSB receiver subassemblies or circuit cards to circuit level components	0	0	0	0	0	0	0	1	0	0
H 592	H 592	H4-32 Do you align or adjust SSB receivers or circuits	0	0	0	0	0	0	0	2	1	0
H 593	H 593	H4-33 Do you use "FM" modulation principles	17	0	0	37	0	0	1	23	2	0
H 594	H 594	H4-34 Do you trace block diagrams of FM transmitters	24	11	4	37	0	0	0	23	2	0
H 595	H 595	H4-35 Do you trace block diagrams of FM transmitter subassemblies or circuit cards	24	0	4	5	0	0	0	17	0	0
H 596	H 596	H4-36 Do you trace schematic diagrams of FM transmitter subassemblies or circuit cards	17	0	4	0	0	0	0	17	0	0
H 597	H 597	H4-37 Do you troubleshoot FM transmitters to major units	24	0	4	37	0	0	0	21	0	0
H 598	H 598	H4-38 Do you troubleshoot FM transmitters to subassemblies or circuit cards	7	0	4	0	0	0	0	11	0	0
H 599	H 599	H4-39 Do you troubleshoot FM transmitter subassemblies or circuit cards to circuit level components	3	0	4	0	0	0	0	10	0	0
H 600	H 600	H4-40 Do you align or adjust FM transmitters or circuits	17	0	4	0	0	0	0	21	0	0
H 601	H 601	H4-41 Do you calculate modulation index for FM transmitters	3	0	0	5	0	0	0	8	0	0
H 602	H 602	H4-42 Do you measure frequency deviation for FM transmitters	14	0	4	26	0	0	0	22	0	0
H 603	H 603	H4-43 Do you use "FM" demodulation principles	17	0	0	42	1	1	1	24	3	0

D T Tsk Y Nbr	Task Title	Occupational Analysis Program USAFOMC (ATC) Randolph AFB TX											
		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	463 50	463 50	463 50	463 50	463 50
H 604	H4-44 Do you trace block diagrams of FM receivers	21	5	4	37	0	0	0	0	26	4	0	0
H 605	H4-45 Do you trace block diagrams of FM receiver subassemblies or circuit cards	21	0	4	5	0	0	0	0	19	1	0	0
H 606	H4-46 Do you trace schematic diagrams of FM receiver subassemblies or circuit cards	7	0	4	0	0	0	0	0	19	1	0	0
H 607	H4-47 Do you troubleshoot FM receivers to major units	14	0	4	37	0	0	0	0	23	1	0	0
H 608	H4-48 Do you troubleshoot FM receivers to subassemblies or circuit cards	3	0	4	0	0	0	0	0	14	1	0	0
H 609	H4-49 Do you troubleshoot FM receiver subassemblies or circuit cards to circuit level components	7	0	4	0	0	0	0	0	11	0	0	0
H 610	H4-50 Do you align or adjust FM receivers or circuits	10	0	4	0	0	0	0	0	26	2	0	0
H 611	H4-51 Do you plot receiver signal level curves (RSL) for FM receivers	7	0	0	11	0	0	0	0	8	0	0	0
H 612	H4-52 Do you use "PM" modulation principles	17	11	7	37	0	0	0	0	9	1	0	0
H 613	H4-53 Do you trace block diagrams of PM transmitter subassemblies or circuit cards	21	21	14	37	0	0	0	0	9	2	0	0
H 614	H4-54 Do you trace block diagrams of PM transmitter subassemblies or circuit cards	24	11	11	5	0	0	0	0	8	0	0	0
H 615	H4-55 Do you trace schematic diagrams of PM transmitter subassemblies or circuit cards	10	11	11	0	0	0	0	0	8	0	0	0
H 616	H4-56 Do you troubleshoot PM transmitters to major units	17	11	14	37	0	0	0	0	7	0	0	0
H 617	H4-57 Do you troubleshoot PM transmitters to sub-assemblies or circuit cards	14	11	4	0	0	0	0	0	7	0	0	0
H 618	H4-58 Do you troubleshoot PM transmitter subassemblies or circuit cards to circuit level components	7	0	4	0	0	0	0	0	5	0	0	0
H 619	H4-59 Do you align or adjust PM transmitters or circuits	28	11	7	0	0	0	0	0	7	0	0	0
H 620	H4-60 Do you calculate pulse recurrence time (PRT) or pulse recurrence frequency (PRF) for PM transmitters	24	5	11	21	0	0	0	0	8	0	0	0
H 621	H4-61 Do you measure PRT, PRF or pulse width for PM transmitters	31	11	14	37	0	0	0	0	8	0	0	0
H 622	H4-62 Do you use "PM" demodulation principles	7	0	4	37	0	0	0	0	9	1	0	0
H 623	H4-63 Do you trace block diagrams of PM receivers	17	5	14	37	0	0	0	0	10	2	0	0
H 624	H4-64 Do you trace block diagrams of PM receiver subassemblies or circuit cards	17	5	11	5	0	0	0	0	9	0	0	0
H 625	H4-65 Do you trace schematic diagrams of PM receiver subassemblies or circuit cards	14	0	7	0	0	0	0	0	9	0	0	0
H 626	H4-66 Do you troubleshoot PM receivers to major units	14	0	11	37	0	0	0	0	8	0	0	0
H 627	H4-67 Do you troubleshoot PM receivers to subassemblies or circuit cards	14	0	7	5	0	0	0	0	8	0	0	0
H 628	H4-68 Do you troubleshoot PM receiver subassemblies or circuit cards to circuit level components	10	0	4	0	0	0	0	0	5	0	0	0
H 629	H4-69 Do you align or adjust PM receivers or circuits	17	5	7	0	0	0	0	0	7	0	0	0

0042 VIII 5. H5 Antennas

H 630	H5-1 Do you physically align antennas	76	42	18	37	1	0	1	0	24	3	0	0
H 631	H5-2 Do you electrically align antennas	41	53	18	16	0	0	0	0	13	3	0	0
H 632	H5-3 Do you troubleshoot loading of antennas	14	11	0	42	0	0	0	0	10	1	0	0
H 633	H5-4 Do you troubleshoot coupling of antennas	31	32	0	47	0	0	0	0	16	1	0	0

D	Tsk	Task Title	456	456	457	457	461	462	463	991	991	991
Y	Nbr		X2A	X2B	X3A	X3C	50	50	50	04	05	06

0045 IX 2. I2 RF Calculations

I 665	I2-1	Do you calculate RF apparent power	7	21	0	32	0	0	0	8	1	0
I 666	I2-2	Do you calculate RF true power	10	21	0	26	0	0	0	9	0	0
I 667	I2-3	Do you calculate RF power loss or gain in db	52	37	7	42	0	0	1	15	1	0

0046 X. Additional Circuits, Devices, Systems, or Items

0047 X 1. J1 Microphones and Speakers

J 668	J1-1	Do you trace block diagrams of circuits containing microphones	0	0	0	16	0	0	0	9	0	0
J 669	J1-2	Do you trace schematic diagrams of microphone circuits	0	0	0	5	0	0	0	8	0	0
J 670	J1-3	Do you troubleshoot to isolate a faulty microphone	0	0	0	16	0	0	1	9	0	1
J 671	J1-4	Do you troubleshoot microphones	0	0	0	0	0	0	0	7	0	1
J 672	J1-5	Do you work on carbon microphones	0	0	0	0	0	0	0	1	0	0
J 673	J1-6	Do you work on capacitor microphones	0	0	0	11	0	0	0	1	0	0
J 674	J1-7	Do you work on crystal microphones	0	0	0	11	0	0	0	2	0	0
J 675	J1-8	Do you work on dynamic microphones	0	0	0	11	0	0	0	6	0	1
J 676	J1-9	Do you work on velocity ribbon microphones	0	0	0	0	0	0	0	1	0	0
J 677	J1-10	Do you trace block diagrams of circuits containing speakers	0	0	0	5	0	0	0	24	1	0
J 678	J1-11	Do you trace schematic diagrams of speaker circuits	0	0	0	0	0	0	0	22	0	0
J 679	J1-12	Do you troubleshoot to isolate a faulty speaker	0	0	0	5	0	0	1	23	1	2
J 680	J1-13	Do you troubleshoot speakers	0	0	0	0	0	0	0	13	0	0

0048 X 2. J2 Photosensitive Devices

J 681	J2-1	Do you trace block diagrams of circuits containing photosensitive devices	0	0	0	0	0	0	0	33	8	2
J 682	J2-2	Do you trace schematic diagrams of photosensitive device circuits	0	0	0	0	0	0	0	32	4	2
J 683	J2-3	Do you troubleshoot to isolate a faulty photosensitive device	0	0	0	0	0	0	0	29	2	2
J 684	J2-4	Do you adjust or calibrate photosensitive devices	0	0	4	0	0	0	0	22	2	3
J 685	J2-5	Do you work on photodiodes	0	0	0	0	0	0	0	25	5	0
J 686	J2-6	Do you work on phototransistors	0	0	0	0	0	0	0	22	1	0
J 687	J2-7	Do you work on phototubes	0	0	0	0	0	0	0	8	1	3
J 688	J2-8	Do you work on photo-SCRs	0	0	0	0	0	0	0	3	1	0

D Task Title
Y Nbr

456 456 457 457 461 462 463 991 991 991
X2A X2B X3A X3C 50 50 04 05 06

J 689 J2-9 Do you work on photocells (Photoconductive or Photovoltaic)

0 0 0 0 0 0 0 0 19 1 1

0049 X 3. J3 Storage Type Display Tubes

J 690 J3-1 Do you trace block diagrams of circuits containing display tubes

0 0 0 5 0 0 0 2 1 0

J 691 J3-2 Do you trace schematic diagrams of display tubes or circuits

0 0 0 0 0 0 0 2 0 0

J 692 J3-3 Do you troubleshoot to isolate a faulty display tube

0 0 0 0 0 0 0 2 0 0

J 693 J3-4 Do you adjust or calibrate display tubes or circuits

0 0 0 0 0 0 0 3 0 0

J 694 J3-5 Do you work on direct view storage tubes (DVST)

0 5 0 0 0 0 0 0 0 0

J 695 J3-6 Do you work on multiple mode storage tubes (MMST)

0 0 0 0 0 0 0 0 0 0

J 696 J3-7 Do you work on scan converter tubes (SCT)

0 0 0 0 0 0 0 0 0 0

0050 X 4. J4 Television, Laser, and Infrared Systems

J 697 J4-1 Do you trace block diagrams of TV systems or subassemblies

0 0 0 7 5 0 1 1 1 1

J 698 J4-2 Do you trace schematic diagrams of TV systems or component circuits

0 0 0 7 0 0 1 1 0 1

J 699 J4-3 Do you troubleshoot TV systems to major subassemblies

0 0 0 7 5 2 1 1 0 1

J 700 J4-4 Do you troubleshoot TV systems to circuit level components

0 0 0 0 0 1 0 1 0 0

J 701 J4-5 Do you adjust or calibrate TV systems or components

0 0 0 4 0 0 0 0 0 3

J 702 J4-6 Do you trace block diagrams of laser systems or subassemblies

0 0 0 0 0 0 0 1 1 0

J 703 J4-7 Do you trace schematic diagrams of laser systems or component circuits

0 0 0 0 0 0 0 1 0 0

J 704 J4-8 Do you troubleshoot laser systems to major subassemblies

0 0 0 0 0 1 0 1 0 0

J 705 J4-9 Do you troubleshoot laser systems to circuit level components

0 0 0 0 0 0 0 0 0 0

J 706 J4-10 Do you adjust or calibrate laser systems or components

0 0 0 0 0 1 0 1 0 0

J 707 J4-11 Do you trace block diagrams of infrared systems or subassemblies

0 0 0 7 0 0 0 1 1 0

J 708 J4-12 Do you trace schematic diagrams of infrared systems or component circuits

0 0 0 7 0 0 0 1 0 0

J 709 J4-13 Do you troubleshoot infrared systems to major subassemblies

0 0 0 7 0 2 0 1 0 0

J 710 J4-14 Do you troubleshoot infrared systems circuit level components

0 0 0 0 0 1 0 0 0 0

D T Tsk Y Nbr	Task Title										
		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
J 711	J4-15 Do you inspect, clean, or service infrared systems or components	0	0	7	0	3	0	0	1	0	0
J 712	J4-16 Do you adjust or calibrate infrared systems or components	0	0	4	0	1	0	0	1	0	0

0051 Tasks not referenced

Report Option Table for Modules

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Report Option Table for Tasks

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Description of Reported Module Factors

Col	Factor	Source vector	Title	Module Statement	Number Members	Mean	S.D.	Based on All Tasks Within Range	Min	Max	Valid
1	TITLE										

Description of Reported Task Factors

Col	Factor	Source vector	Title	Task Statement	Number Members	Mean	S.D.	Based on All Tasks Within Range	Min	Max	Valid
1	TITLE										

PRTMOD Lowry ITC AFSCs matched to EF/A STS (1 of 3)

PH0036

Occupational Analysis Program
USAFOMC (ATC) Randolph AFB TX

Page 2

Col	Factor	Source vector	Title	Number Members	----- Based on All Tasks Within Range -----			
					Mean	S.D.	Max	Min Valid
13	F0062	GP0065/PHP	All DAFSC 45251A	125	11.24	17.77	98.40	.00 712
14	F0063	GP0066/PHP	All DAFSC 45251B	82	7.95	16.95	98.78	.00 712
15	F0064	GP0067/PHP	All DAFSC 45251C	92	9.26	15.97	92.39	.00 712

D	T Tsk	Task Title	304	309	316	324	404	451	451	451	451	451	451	452	452	452
Y Nbr			55	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B	51C
0007		2a. Theory of operation	B													
A 4		A1-4 Do you trace schematic or block diagrams of circuits containing conductors, fuses, lamps, switches, or batteries	89	93	86	99	95	99	94	99	98	97	90	99	79	79
0008		2b. Troubleshoot circuits	2b													
A 5		A1-5 Do you troubleshoot circuits containing conductors, fuses, lamps, switches, or batteries	91	90	85	98	96	96	87	98	96	94	76	99	75	75
0009		3. Basic Circuit Calculations														
0010		3a. DC	B													
A 6		A1-6 Do you calculate values of DC voltage, current, resistance, or power	61	56	54	91	39	69	63	48	64	70	74	24	16	20
A 12		A1-12 Do you calculate the value of a resistor required for a circuit	53	45	45	87	46	45	34	30	44	51	53	6	12	4
0011		3b. AC	B													
A 7		A1-7 Do you calculate values of AC effective voltage, average voltage, or peak-to-peak voltage	57	56	47	87	30	67	63	48	71	67	74	21	9	13
A 8		A1-8 Do you calculate values of frequency, phase relationship, or wave length	61	63	48	86	23	68	65	48	76	77	74	22	7	14
0012		4. Resistors														
0013		4a. Theory of operation	B													
A 9		A1-9 Do you trace schematic or block diagrams of circuits containing resistors	90	92	79	98	88	95	95	85	98	97	91	30	61	32

D T Y	Tsk Nbr	Task Title	304	309	316	324	404	451	451	451	451	451	452	452	452
A	11	Al-11 Do you calibrate or adjust circuits by using variable resistors	55	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B 51C
			88	87	74	98	73	88	91	84	92	92	82	8	34 12
0014	4b.	Isolate faulty resistors	2b												
A	10	Al-10 Do you troubleshoot circuits to isolate a faulty resistor.	89	81	70	98	82	77	74	60	91	90	76	13	33 10
A	14	Al-14 Do you ohm check resistors	90	85	80	98	86	90	90	80	95	92	88	15	39 20
0015	4c.	Color code	B												
A	13	Al-13 Do you determine ohmic value of a resistor using the color code	88	72	73	96	76	74	62	47	79	88	74	6	12 7
0016	5.	Relays/Solenoids													
0017	5a.	Relay theory of operation	B												
A	15	Al-15 Do you trace schematic or block diagrams of circuits containing relays	72	82	68	92	88	99	98	91	99	99	88	84	95 82
A	17	Al-17 Do you adjust relays	37	34	26	52	53	27	23	17	36	29	35	20	12 11
A	18	Al-18 Do you perform tasks on contacts, cores, coils, armatures, or springs	55	41	26	64	73	38	32	17	34	39	35	20	17 11
0018	5b.	Isolate faulty relays	2b												
A	16	Al-16 Do you troubleshoot circuits to isolate a faulty relay	71	76	61	90	90	96	98	78	99	99	91	77	94 75
A	19	Al-19 Do you continuity check relays	67	71	60	90	85	94	93	75	96	95	76	63	83 66
0019	5c.	Solenoid theory of operation													
A	77	A2-33 Do you trace schematic or block diagrams of circuits containing solenoids	61	55	20	29	75	43	47	30	25	33	38	13	48 4
A	79	A2-35 Do you perform maintenance on solenoid component parts	41	27	13	15	58	19	21	10	11	12	26	5	2 0

E	T	Task Title	304	309	316	324	404	451	451	451	451	451	451	452	452	452	452	452	452
Y	Nbr		55	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B	51C			

0020 5d. Isolate faulty solenoids

A	78	A2-34 Do you troubleshoot circuits to isolate a faulty solenoid	61	50	20	29	80	38	42	23	24	30	38	9	39	3
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0021 6. Inductors

0022 6a. Theory of operation B

A	20	A1-20 Do you trace schematic or block diagrams of circuits containing inductors, chokes, or choke coils	83	83	41	87	41	63	62	48	68	70	65	18	16	16
A	25	A1-25 Do you calibrate or adjust circuits by using variable inductors	72	52	22	79	18	37	37	17	28	51	38	5	4	1

0023 6b. Isolate faulty inductors 2b

A	21	A1-21 Do you troubleshoot circuits to isolate a faulty inductor, choke, or choke coil	80	74	31	82	35	42	48	26	54	62	53	7	11	5
A	26	A1-26 Do you ohm check inductors	78	66	30	74	35	46	43	29	52	53	50	7	12	5

0024 6c. Calculations B

A	22	A1-22 Do you calculate values of circuit total inductance	24	26	14	48	11	17	18	8	15	23	21	5	2	1
A	23	A1-23 Do you calculate values of circuit or component inductive reactance	25	23	15	49	10	16	16	8	14	19	24	5	2	1
A	24	A1-24 Do you calculate values of circuit voltage or current in circuits containing inductors	33	31	17	60	11	18	22	11	20	25	24	4	2	2

0025 7. Capacitors

D Tsk
 Y Nbr Task Title 304 309 316 324 404 451 451 451 451 451 451 451 452 452 452
 55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0026 7a. Theory of operation B

A 27 Al-27 Do you trace schematic or block diagrams of circuits containing capacitors 91 89 69 97 83 91 88 82 97 94 79 26 62 28
 A 32 Al-32 Do you calibrate or adjust circuits using variable capacitors 76 56 35 94 31 52 55 27 31 66 47 2 35 2

0027 7b. Isolate faulty capacitors 2b

A 28 Al-28 Do you troubleshoot circuits to isolate a faulty capacitor 91 80 61 96 82 64 70 49 90 86 71 10 49 9
 A 33 Al-33 Do you ohm check capacitors 84 73 46 84 70 65 63 45 77 74 56 11 44 10

0028 7c. Calculations

A 29 Al-29 Do you calculate values of circuit total capacitance 32 27 25 58 27 25 23 13 24 27 26 6 12 3
 A 30 Al-30 Do you calculate values of circuit or component capacitive reactance 27 25 24 55 22 23 20 11 20 22 24 6 12 2
 A 31 Al-31 Do you calculate values of circuit or component voltage or current in circuits containing capacitors 37 32 25 68 26 27 27 15 26 27 24 4 12 2

0029 7d. Color code B

A 34 Al-34 Do you use capacitor color codes in your present job 25 21 18 48 25 18 18 9 16 18 24 6 5 2

0030 8. Transformers

0031 8a. Theory of operation B

A 35 Al-35 Do you trace schematic or block diagrams of circuits containing transformers 89 81 61 96 85 86 84 76 97 86 82 27 41 24
 A 39 Al-39 Do you calibrate or adjust circuits using variable transformers 44 39 16 68 35 35 33 22 42 47 35 4 7 2

D Task Title
 T 304 309 316 324 404 451 451 451 451 451 451 451 452 452 452
 Y Nbr 55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0032	8b. Isolate faulty transformers	2b															
A 36	A1-36 Do you troubleshoot circuits to isolate a faulty transformer		88	74	51	94	82	75	73	53	96	82	82	16	27	5	
A 40	A1-40 Do you ohm check transformers		83	61	43	84	69	55	55	41	75	61	68	14	20	5	
A 41	A1-41 Do you measure transformer output voltage		86	66	51	93	77	75	69	55	85	75	65	13	24	7	
0033	8c. Calculations	-															
A 37	A1-37 Do you calculate transformer voltage or current step-up or step-down ratios		37	31	24	67	42	34	29	17	39	32	32	6	4	1	
A 38	A1-38 Do you calculate impedance of transformers		24	17	16	42	19	23	16	11	20	16	24	7	2	1	
0034	9. Three Phase Transformers																
0035	9a. Theory of operation	B															
A 42	A1-42 Do you trace schematic or block diagrams of circuits containing three phase transformers		31	55	27	55	37	67	59	46	71	64	68	17	18	9	
A 44	A1-44 Do you adjust three phase transformers		17	24	11	36	18	33	23	23	43	37	41	4	4	1	
0036	9b. Isolate faulty three phase transformers	-															
A 43	A1-43 Do you troubleshoot circuits to isolate a faulty three phase transformer		27	49	24	50	32	58	51	33	67	58	62	11	13	5	
0037	10. DC Motors																
0038	10a. Theory of operation	B															
A 45	A2-1 Do you trace schematic or block diagrams of circuits containing DC motors		70	66	27	44	83	50	39	34	46	51	50	18	46	5	

PRTHOD

Lowry TTC AFSCs matched to EF/A STS (1 of 3)

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A 48 A2-4 Do you perform tasks on DC motor component parts
304 309 316 324 404 451 451 451 451 451 451 451 451 452 452 452
55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0039 10b. Isolate faulty DC motors 2b

A 46 A2-2 Do you troubleshoot circuits to isolate a faulty DC motor

70 61 24 42 85 48 37 33 45 49 53 12 39 4

0040 10c. Troubleshoot motors 2b

A 47 A2-3 Do you troubleshoot DC motor component parts

0041 11. AC Motors
39 33 12 25 61 14 15 11 20 21 32 5 11 1

0042 11a. Theory of operation B

A 49 A2-5 Do you trace schematic or block diagrams of circuits containing AC motors

52 63 24 38 79 53 45 37 52 51 59 16 43 5

A 52 A2-8 Do you perform tasks on AC motor component parts

29 29 11 20 58 12 16 10 16 18 32 5 5 1

0043 11b. Isolate faulty AC motors 2b

A 50 A2-6 Do you troubleshoot circuits to isolate a faulty AC motor

54 60 20 36 82 48 45 35 52 48 59 9 34 4

0044 11c. Troubleshoot motors 2b

A 51 A2-7 Do you troubleshoot AC motor component parts

30 29 11 20 53 15 15 9 21 18 38 4 9 1

0045 12. DC Generators

D 304 309 316 324 404 451 451 451 451 451 451 451 452 452 452
T 55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C
Y

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0046 12a. Theory of operation

A 53 A2-9 Do you trace schematic or block diagrams of circuits 17 20 14 43 11 31 30 20 22 29 47 14 18 5
A 56 A2-12 Do you perform tasks on component parts of DC generators 15 13 6 37 6 9 10 8 11 19 18 3 4 1

0047 12b. Isolate faulty DC generators

A 54 A2-10 Do you troubleshoot to isolate a faulty DC generator 18 19 12 39 10 30 26 18 22 27 50 9 12 3

0048 12c. Troubleshoot DC generators

A 55 A2-11 Do you troubleshoot DC generator component parts 15 14 8 38 7 12 12 7 13 22 21 4 4 1

0049 13. AC Generators

0050 13a. Theory of operation

A 57 A2-13 Do you trace schematic or block diagrams of circuits 13 23 12 46 8 30 29 18 21 25 53 14 20 5
A 60 A2-16 Do you perform tasks on component parts of AC generators 11 16 6 40 4 9 10 7 11 17 18 2 2 1

0051 13b. Isolate faulty AC generators

A 58 A2-14 Do you troubleshoot circuits to isolate a faulty AC generator 13 20 9 42 7 28 26 16 23 21 53 10 12 3

0052 13c. Troubleshoot AC generators

A 59 A2-15 Do you troubleshoot AC generator component parts 11 15 6 41 4 11 11 6 13 19 18 4 1 1

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55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0053 14. Alternators

0054 14a. Theory of operation

A 61 A2-17 Do you trace schematic or block diagrams of circuits containing alternators 3 6 3 5 4 5 7 8 5 4 6 6 12 3
A 62 A2-20 Do you perform tasks on component parts of alternators 3 3 1 4 4 1 2 2 2 3 3 1 1 1

0055 14b. Isolate faulty alternators

A 62 A2-18 Do you troubleshoot circuits to isolate a faulty alternator 3 4 2 4 4 4 5 5 5 4 3 2 12 2

0056 14c. Troubleshoot alternators

A 63 A2-19 Do you troubleshoot alternator component parts 3 3 1 4 4 2 2 3 2 3 3 1 2 1

0057 15. Synchro/Servos

0053 15a. Theory of operation

B

A 65 A2-21 Do you trace schematic or block diagrams of circuits containing synchros or servos 57 65 23 60 12 60 62 61 83 49 68 49 89 21
A 66 A2-24 Do you perform tasks on component parts of synchros or servos 44 39 15 40 6 14 18 14 37 18 47 13 12 7

0059 15b. Isolate faulty synchro/servos 2b

A 66 A2-22 Do you troubleshoot circuits to isolate a faulty synchro or servo 57 62 21 56 11 55 62 48 82 49 65 38 83 18

304 309 316 324 404 451 451 451 451 451 451 451 452 452 452
55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

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Y Nbr Task Title

0060 15c. Troubleshoot synchro/servos 2b

A 67 A2-23 Do you troubleshoot synchro or servo component parts 43 41 14 43 6 18 25 17 42 20 47 15 38 7

0061 16. Choppers (Synchronous Vibrators)

0062 16a. Theory of operation B

A 69 A2-25 Do you trace schematic or block diagrams of circuits containing choppers 11 8 7 48 7 21 9 13 14 18 32 10 12 3

0063 16b. Isolate faulty choppers 2b

A 70 A2-26 Do you troubleshoot circuits to isolate a faulty chopper 11 6 6 48 5 16 7 8 12 16 29 6 13 1
A 71 A2-27 Do you measure chopper coil excitation frequency 8 4 3 38 2 9 1 4 5 8 9 3 7 1
A 72 A2-28 Do you measure chopper coil voltage-current phase relationship 6 3 3 23 2 9 1 3 6 5 9 3 7 1

0064 17. Transducers

0065 17a. Theory of operation B

A 73 A2-29 Do you trace schematic or block diagrams of circuits containing transducers 18 18 32 45 4 38 22 48 17 23 41 16 74 8
A 75 A2-31 Do you calibrate or adjust transducers 13 14 27 44 4 14 8 31 11 10 38 5 62 2
A 76 A2-32 Do you repair, clean or lubricate transducers 17 15 24 32 4 12 10 19 10 8 32 5 21 1

0066 17b. Isolate faulty transducers 2b

A 74 A2-30 Do you troubleshoot circuits to isolate a faulty transducer 18 17 33 44 4 30 20 40 17 21 38 11 67 3

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T Task
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55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

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0067 18. Meter Movements

0068 18a. Theory of operation B

A 80 A2-36 Do you trace schematic or block diagrams of circuits 59 60 36 91 38 46 55 39 52 49 56 16 26 11
containing meter movements
A 82 A2-38 Do you perform maintenance on meter movement 34 28 16 69 27 10 18 10 20 19 26 5 4 4
mechanical parts

0069 18b. Isolate faulty meter movements 2b

A 81 A2-37 Do you troubleshoot circuits to isolate a faulty 57 53 32 90 38 36 45 30 49 47 53 11 23 9
meter movement

0070 19. Solid State Diodes

0071 19a. Theory of operation B

A 83 A3-1 Do you trace schematic or block diagrams of circuits 89 89 68 97 67 94 92 82 95 95 88 34 70 38
containing diodes

0072 19b. Isolate faulty solid state diodes 2b

A 84 A3-2 Do you troubleshoot circuits to isolate a faulty diode 89 82 63 96 65 77 80 56 94 92 85 21 49 18
A 85 A3-3 Do you check diodes using an ohmmeter 89 82 65 96 69 79 85 64 92 93 79 18 48 21

0073 19c. Specifications B

A 86 A3-4 Do you use diode characteristic curves 26 21 16 62 15 11 9 8 18 25 21 3 0 1
A 87 A3-5 Do you use diode substitution information 67 47 34 81 20 16 19 12 39 45 50 4 1 1

D	T	Tsk	Nbr
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304 319 316 324 404 451 451 451 451 451 452 452 452
55 55 3 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0074 19d. Color code

62

A 88 A3-6 Do you use diode color codes

24 18 13 35 18 13 12 8 14 23 26 8 2 4

0075 20. Bipolar Junction Transistors

0076 20a. Theory of operation

8

A 89 A3-7 Do you trace schematic or block diagrams of circuits containing transistors

90 88 70 97 73 91 93 80 98 97 82 26 40 32

00077 20b. Isolate faulty transistors

2b

A 90 A3-8 Do you troubleshoot circuits to isolate a faulty transistor

90 81 62 97 70 74 79 54 96 91 79 13 16 5

A 91 A3-9 Do you check transistors using an ohmmeter

90 80 59 96 67 74 53 92 90 68 10 13 5

A 92 A3-10 Do you check transistors using transistor testers

82 46 32 89 38 28 27 15 48 45 47 6 1 1

20078 20c. Specifications

50

A 93 A3-11 Do you use transistor characteristic curves

28 19 18 62 12 11 11 4 15 21 21 3 0 1

A 94 A3-12 Do you use transistor substitution information

778	56	41	87	26	21	20	12	39	50	44	5	0	1
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21. Integrated Circuits

0080 21a. Familiarization

20

A 95 A3-13 Do you trace schematic or block diagrams of circuits containing integrated circuits (IC)

88	89	66	95	55	95	87	81	86	94	88	34	50	30
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Y Nbr 304 309 316 324 404 451 451 451 451 451 451 451 452 452 452 452
55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0081 21b. Isolate faulty integrated circuits 2b

A 96 A3-14 Do you troubleshoot circuits to isolate a faulty IC 89 79 61 95 47 77 70 46 82 87 79 13 24 8

0082 21c. Specifications B

A 97 A3-15 Do you use IC substitution information 77 68 52 84 25 33 34 16 36 51 44 6 2 4

0083 22. Solid State Special Purpose Devices (SCR, Zener Diode, Tunnel Diode, LED, LCD, UJT, JFET, MOSFET)

0084 22a. Theory of operation B

A 98 A3-16 Do you trace schematic or block diagrams of circuits containing solid-state special purpose devices 70 74 46 86 36 60 60 51 55 74 62 26 16 15
A 100 A3-18 Do you perform tasks on varactors/varicaps 50 42 13 67 11 21 29 11 18 33 32 6 1 3
A 101 A3-19 Do you perform tasks on tunnel diodes 20 37 7 83 11 18 26 5 21 37 26 2 1 2
A 102 A3-20 Do you perform tasks on field effect transistors (FET) 75 68 39 90 30 50 41 21 48 69 50 11 2 3
A 103 A3-21 Do you perform tasks on unijunction transistors (UJT) 56 45 19 82 20 34 34 13 39 63 44 7 1 3
A 104 A3-22 Do you perform tasks on zener diodes 83 73 51 93 45 60 60 33 67 79 47 11 13 8
A 105 A3-23 Do you perform tasks on liquid crystal displays (LCD) 44 43 33 82 25 38 37 23 40 41 47 13 7 5
A 106 A3-24 Do you perform tasks on pin diodes 19 27 18 72 18 17 35 12 12 55 29 6 2 2
A 107 A3-25 Do you perform tasks on light emitting diodes (LED) 72 76 53 89 45 58 52 44 50 66 56 24 13 9
A 108 A3-26 Do you perform tasks on fantail transistors 16 17 4 38 9 11 11 4 8 15 12 3 1 2
A 109 A3-27 Do you perform tasks on silicon controlled rectifiers (SCR) 70 71 23 83 34 26 34 11 40 49 50 9 1 4
A 110 A3-28 Do you perform tasks on triacs 25 24 9 45 29 11 18 5 16 21 18 9 2 3
A 111 A3-29 Do you perform tasks on programmable unijunction transistors (PUT) 11 11 3 33 9 10 11 2 5 8 24 4 1 3
A 112 A3-30 Do you perform tasks on silicon controlled switches (SCS) 23 25 9 42 14 12 13 6 13 21 32 5 2 3
A 113 A3-31 Do you perform tasks on silicon unilateral switches (SUS) 11 8 3 25 8 10 7 3 5 8 21 4 1 2
A 114 A3-32 Do you perform tasks on step recovery diodes (SRD) 9 14 2 31 9 11 14 3 6 10 12 2 2 2
A 115 A3-33 Do you perform tasks on field effect diodes (FED) 25 28 13 44 15 23 23 9 21 28 35 5 2 2
A 116 A3-34 Do you perform tasks on DIAC (Bi-directional trigger diode) 7 12 3 29 8 9 15 4 7 15 15 2 0 2
A 117 A3-35 Do you perform tasks on varistors 52 45 18 71 27 24 22 19 27 38 21 5 1 3
A 118 A3-36 Do you perform tasks on metal oxide varistors (MOV) 12 15 5 31 8 9 7 2 5 10 12 2 0 2

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55	50	53	50	50	54A 54B 55 56A 56B X7 51A 51B 51C

A 119	A3-37	Do you perform tasks on schottky diodes	16	29	16	60	11	30	26	8	24	41	29	3	1	2
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0085 22b. Isolate faulty special purpose devices 2b

A 99 A3-17 Do you troubleshoot circuits to isolate a faulty solid-state special purpose device

0086 23. Electron Tubes

0087 23a, Theor. of operation B

A	120	A4-1 Do you trace block diagrams of circuits containing electron tubes	55	26	9	84	28	25	40	22	38	72	26	8	2	7
A	121	A4-2 Do you trace schematic diagrams of electron tube circuits	54	24	9	83	26	21	34	14	33	65	26	4	1	2
A	125	A4-6 Do you perform tasks on diode tubes	19	4	4	68	15	6	10	5	11	22	6	2	0	2
A	126	A4-7 Do you perform tasks on triode tubes	23	3	4	69	10	4	13	2	8	24	9	0	1	1
A	127	A4-8 Do you perform tasks on tetrode tubes	21	4	2	59	6	4	4	1	5	21	6	1	1	1
A	128	A4-9 Do you perform tasks on pentode tubes	22	2	2	61	7	4	5	1	5	18	6	2	1	0
A	129	A4-10 Do you perform tasks on beam power tubes	13	13	0	33	6	5	15	4	4	17	6	2	0	0
A	130	A4-11 Do you perform tasks on gas tubes	10	4	3	56	10	6	3	2	8	16	6	1	0	0
A	131	A4-12 Do you perform tasks on phantastons	2	1	0	18	4	4	2	2	2	3	6	1	0	0
A	132	A4-13 Do you perform tasks on neon tubes	7	8	3	46	12	2	2	2	5	9	0	1	0	2
A	133	A4-14 Do you perform tasks on xenon tubes	4	2	2	24	14	1	2	1	4	7	0	0	0	0
A	134	A4-15 Do you perform tasks on nixie tubes	6	22	9	75	8	13	7	1	48	32	0	2	1	1

0088 23b. Isolate faulty tubes

A 122	A4-3 Do you troubleshoot circuits to isolate a faulty electron tube	55	25	9	83	25	24	36	19	34	68	29	2	2	3
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0089 23c. Specifications

A 123	A4-4	Do you use electron tube characteristic curves
A 124	A4-5	Do you use electron tube substitution manuals or charts

D
 T Task
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0090 24. Cathode Ray Tubes (CRT)

0091 24a. Theory of operation B

A 135 A4-16 Do you trace block diagrams of circuits containing cathode ray tubes (CRT) 80 52 13 80 37 65 41 56 39 50 56 45 11 28
 A 136 A4-17 Do you trace schematic diagrams of CRT circuits 79 45 12 77 37 52 33 47 35 44 56 33 5 8
 A 138 A4-19 Do you adjust or calibrate circuits that control CRT operations 80 48 15 80 32 58 38 48 32 45 53 9 2 1
 A 139 A4-20 Do you perform tasks on electrostatic CRT 51 22 4 49 12 26 12 19 15 19 35 6 2 2
 A 140 A4-21 Do you perform tasks on electromagnetic CRT 61 26 8 54 24 34 26 37 21 30 35 15 4 4

0092 24b. Isolate faulty CRTs 2b

A 137 A4-18 Do you troubleshoot to isolate a faulty CRT 81 47 12 77 35 62 39 51 35 50 56 37 9 18

0093 25. Solder/Desolder

0094 25a. Terminal connections 2b

A 141 A5-1 Do you solder or desolder hardware connections 91 84 89 99 97 99 96 97 98 98 85 84 76 61
 A 142 A5-2 Do you solder or desolder component connections such as resistors, capacitors, diodes, transformers, etc 91 83 84 98 96 93 93 81 97 95 85 13 20 12

0095 25b. P C Boards 2b

A 143 A5-3 Do you solder or desolder printed circuit board connections 86 77 71 95 77 78 73 66 86 85 59 11 5 5
 A 144 A5-4 Do you solder or desolder multi-layer circuit board connections 53 46 37 70 38 33 33 27 39 39 32 10 5 4
 A 145 A5-5 Do you perform high reliability soldering 73 70 61 85 70 86 85 71 84 88 74 46 35 32

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55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

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0096 25c. Multipin connectors 2b

A 149 A5-9 Do you repair or fabricate connectors or cables on
multiconductor cables 80 60 81 63 37 77 70 80 69 62 85 62 62 57
A 152 A5-12 Do you repair or fabricate connectors or cables on
ribbon cables 38 45 56 51 27 25 46 52 30 46 71 12 6 7

0097 25d. Coaxial connectors

A 150 A5-10 Do you repair or fabricate connectors or cables on
coaxial cables 91 82 89 82 49 99 96 94 95 96 88 98 44 92
A 151 A5-11 Do you repair or fabricate connectors or cables on
triaxial cables 31 28 35 44 16 91 65 64 25 40 68 98 38 68

0098 26. Assemble Solderless Connectors

0099 26a. Crimp 2b

A 146 A5-6 Do you use crimping tool to repair or make connections 86 83 89 89 92 92 97 96 97 99 96 88 98 95 91
A 147 A5-7 Do you use wire wrap tool to make connections 33 67 52 38 35 83 57 55 44 49 62 38 29 28
A 148 A5-8 Do you use punch-on tool to make connections 34 29 22 28 32 32 39 24 21 21 28 50 30 18 16

0100 26b. Coaxial 2b

A 150 A5-10 Do you repair or fabricate connectors or cables on
coaxial cables 91 82 89 82 49 99 96 94 95 96 88 98 44 92
A 151 A5-11 Do you repair or fabricate connectors or cables on
triaxial cables 31 28 35 44 16 91 65 64 25 40 68 98 38 68

0101 26c. Multipin 2b

A 149 A5-9 Do you repair or fabricate connectors or cables on
multiconductor cables 80 60 81 63 37 77 70 80 69 62 85 62 62 57
A 152 A5-12 Do you repair or fabricate connectors or cables on
ribbon cables 38 45 56 51 27 25 46 52 30 46 71 12 6 7

D
T Task
Y Nbr

Task Title

304 309 316 324 404 451 451 451 451 451 451 452 452 452
55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0102 27. Use Test Equipment Usage

0103 27a. Multimeter, analog 2b

B 153 B1-1 Do you use the multimeter to measure DC voltage values
B 154 B1-2 Do you use the multimeter to measure AC voltage values
B 155 B1-3 Do you use the multimeter to extend the range of
voltage meters using external shunts
B 156 B1-4 Do you use the multimeter to measure DC current values
B 157 B1-5 Do you use the multimeter to measure AC current values
B 158 B1-6 Do you use the multimeter to extend the range of
ammeters using external shunts
B 159 B1-7 Do you use the multimeter to measure circuit resistance
B 160 B1-8 Do you use the multimeter to measure component
resistance

93 92 92 99 98 99 99 97 99 99 91 95 96 89
92 90 91 99 96 98 95 100 96 91 90 95 83
27 25 22 78 21 35 23 18 25 42 44 18 11 11
72 77 78 96 81 76 68 73 77 75 71 63 54 59
64 66 67 92 82 74 66 70 77 71 71 62 52 54
19 17 20 74 18 26 16 13 16 29 44 13 9 10
79 80 75 92 88 89 85 83 90 87 79 78 90 78
90 87 82 98 91 93 88 96 92 88 57 84 64

0104 27b. Oscilloscope 2b

B 161 B2-1 Do you use the oscilloscope to measure time to
determine frequency
B 162 B2-2 Do you use the oscilloscope to measure time (rise,
fall, pulse width, etc)
B 163 B2-3 Do you use the oscilloscope to measure AC voltage
B 164 B2-4 Do you use the oscilloscope to measure DC voltage
B 165 B2-5 Do you use the oscilloscope to measure ripple voltage
B 166 B2-6 Do you use the oscilloscope to measure phase jitters
B 167 B2-7 Do you use the oscilloscope to observe signal/data
patterns
B 168 B2-8 Do you use the oscilloscope to observe lissajous
patterns
B 169 B2-9 Do you use the oscilloscope to observe phase
relationships
B 170 B2-10 Do you use attenuator probes with oscilloscopes
B 171 B2-11 Do you use delay time multipliers with
oscilloscopes

84 84 68 94 12 89 85 78 95 97 85 3 1 3
85 87 64 95 14 90 98 81 95 98 82 3 1 3
80 82 68 94 17 96 98 78 98 96 79 3 2 1
88 88 78 92 17 96 98 78 98 97 79 2 2 1
67 77 37 91 9 56 74 46 76 89 65 2 0 0
38 50 21 73 1 48 68 25 51 47 56 2 1 0
78 83 63 81 10 84 76 52 68 73 62 2 1 1
18 22 8 50 1 17 10 14 17 13 32 2 0 0
73 78 54 84 12 89 88 59 88 81 79 2 1 2
71 72 51 94 8 86 83 67 82 85 65 2 2 3
30 35 22 81 7 71 76 37 43 49 50 1 0 2

0105 27c. Signal Generator 2b

B 172 B3-1 Do you use signal generators (SG) to perform
operational checks

83 79 62 93 4 72 83 72 63 90 74 11 2 7

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Task Title

304 309 316 324 404 451 451 451 451 451 451 451 452 452 452
55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0113 27k. DC restorer

B 192 B4-8 Do you use DC restorers (CRT rejuvenators)

64 3 3 18 3 7 5 2 2 3 24 6 0 2

0114 27l. Logic current tracer

B 193 B4-9 Do you use logic current tracers

17 26 16 66 6 9 13 5 8 7 21 5 0 2

0115 27n. Tube tester

B 194 B4-10 Do you use tube testers

50 3 3 56 9 5 9 1 4 15 15 4 0 2

0116 27p. Logic pulser

B 195 B4-11 Do you use logic pulsers

24 36 18 74 5 13 12 5 7 5 24 5 0 2

0117 27o. Logic analyzer

2b

B 196 B4-12 Do you use logic analyzers

16 49 29 60 4 13 15 8 9 14 41 6 1 2

0118 27p. Signature analyzer

B 197 B4-13 Do you use signature analyzers

8 14 11 59 3 11 9 5 8 6 26 5 0 2

0119 27q. Reflectometer

2b

B 198 B4-14 Do you use reflectometers

5 18 14 40 2 67 31 11 21 7 35 50 26 61

0120 28. Transistor Amplifier Circuits (Common
Emitter, Common Collector, Common Base)

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55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

Task Title

0121 28a. Theory of operation

0122 28a(1). Amplifier circuits B

C 199 C1-1 Do you trace block diagrams of circuits containing transistor amplifiers 85 81 41 90 26 72 64 53 69 86 71 21 18 27

C 200 C1-2 Do you trace schematic diagrams of transistor amplifier circuits 85 77 40 90 26 65 56 42 68 86 65 13 13 16

C 204 C1-6 Do you adjust or align transistor amplifiers 67 60 21 79 6 28 32 18 35 61 44 1 1 2

C 206 C1-8 Do you calculate values of transistor amplifier voltage, current or power gain 33 37 18 59 6 18 20 7 17 28 26 1 0 2

C 207 C1-9 Do you work on compound-connected (Darlington Pair) transistor amplifiers 56 50 13 76 10 16 12 11 21 30 29 2 0 1

C 208 C1-10 Do you work on cascade-connected transistor amplifiers 38 37 12 72 10 23 22 10 25 45 38 2 0 1

C 209 C1-11 Do you work on paraphase transistor amplifiers 15 16 2 49 4 9 7 4 5 8 32 1 0 2

C 210 C1-12 Do you work on push-pull transistor amplifiers 69 50 22 83 12 33 28 16 38 56 38 2 0 5

C 211 C1-13 Do you work on audio transistor amplifiers 74 32 20 72 20 21 30 27 21 51 47 4 1 12

C 212 C1-14 Do you work on wideband transistor amplifiers 38 53 26 77 3 37 32 30 16 51 47 2 1 12

C 213 C1-15 Do you work on IF transistor amplifiers 67 64 20 73 9 49 45 34 39 77 56 8 1 12

C 214 C1-16 Do you work on RF transistor amplifiers 63 66 21 78 7 50 57 38 42 82 56 11 2 14

C 215 C1-17 Do you work on buffer transistor amplifiers 53 53 22 74 5 53 26 19 38 49 41 5 5 3

C 216 C1-18 Do you work on complementary symmetry transistor amplifiers 50 16 4 53 6 11 8 5 13 23 29 1 0 1

C 217 C1-19 Do you work on DC transistor amplifiers (switching applications) 65 51 30 72 16 43 34 23 49 58 41 2 7 7

0123 28a(2). Stabilization circuits B

C 218 C2-1 Do you trace schematic diagrams of amplifier stabilization circuits 63 49 14 65 11 30 29 19 29 38 41 2 7 4

C 220 C2-3 Do you perform tasks on emitter (swamping) resistor stabilization amplifiers 64 44 9 61 11 27 15 26 40 35 1 2 2

C 221 C2-4 Do you perform tasks on self-bias stabilization amplifiers 41 34 8 60 7 18 20 11 21 26 38 2 2 3

C 222 C2-5 Do you perform tasks on thermistor stabilization amplifiers 54 34 7 61 12 27 30 15 29 34 38 2 9 3

C 223 C2-6 Do you perform tasks on diode stabilization amplifiers 65 46 15 68 15 30 29 18 33 42 35 2 5 3

C 224 C2-7 Do you perform tasks on double diode stabilization amplifiers 48 24 5 51 6 21 18 11 22 29 35 1 1 2

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304 309 316 324 404 451 451 451 451 451 451 452 452 452 452
55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0124 28a(3). Coupling circuits

B

C 225 C3-1 Do you trace block diagrams of circuits containing coupling circuits
C 226 C3-2 Do you trace schematic diagrams of coupling circuits
C 229 C3-5 Do you perform tasks on direct coupling circuits
C 230 C3-6 Do you perform tasks on capacitive-resistive coupling circuits
C 231 C3-7 Do you perform tasks on capacitive-inductive coupling circuits
C 232 C3-8 Do you perform tasks on transformer coupling circuits
C 233 C3-9 Do you perform tasks on optical coupling circuits

72 68 26 75 11 42 38 32 35 50 53 14 5 8
70 67 24 75 11 36 35 25 32 47 50 8 4 2
68 62 18 71 9 28 30 18 31 47 47 3 4 1
64 54 16 71 10 23 22 13 26 40 38 4 4 0
60 52 12 67 9 21 18 13 23 37 38 2 1 0
64 56 20 67 10 21 21 18 26 35 44 4 1 1
20 20 9 29 4 6 7 6 6 7 15 1 0 0

0125 28b. Isolate faulty amplifier circuits

2b

C 201 C1-3 Do you troubleshoot to isolate a faulty transistor amplifier
C 205 C1-7 Do you measure transistor amplifier voltage, current, or power gain
C 227 C3-3 Do you troubleshoot circuits to isolate a faulty coupling circuit

85 72 37 89 22 49 47 28 64 79 47 2 4 7
70 62 29 80 11 35 35 21 41 58 44 2 1 3
68 62 19 73 11 24 26 15 30 46 44 4 0 1

0126 28c. Troubleshoot circuits

2b

C 202 C1-4 Do you troubleshoot transistor amplifiers to circuit level components
C 203 C1-5 Do you troubleshoot transistor amplifier distortion
C 219 C2-2 Do you troubleshoot amplifier stabilization circuits to circuit level components
C 228 C3-4 Do you troubleshoot coupling circuits to circuit level components

83 68 31 86 16 35 32 15 50 65 38 2 1 3
61 50 15 69 5 21 20 10 29 44 32 2 0 2
62 47 13 63 9 18 20 9 24 38 35 2 2 1
66 57 16 72 10 17 17 7 26 38 29 4 1 1

0127 29. Electron Tube Amplifiers

D	T	Tsk	Task Title
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304	309	316	324	404	451	451	451	451	451	452	452	452
555	50	53	50	50	54A	54B	55	56A	56B X7	51A	51B	51C

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Task Title

304 309 316 324 404 451 451 451 451 451 451 452 452 452
55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0132 30a. Theory of operation

82

C 249 C5-1 Do you trace block or schematic diagrams of circuits containing operational amplifiers (op amps)

C 251 C5-3 Do you calculate op amp gain

C 252 C5-4 Do you adjust op amp bias, offsets, or drift

C 255 C5-5 Do you use or apply operational amplifiers for general purpose (inverting or non-inverting)

C 254 C5-6 Do you use or apply operational amplifiers as

C 255 differential/comparators
C5-7 Do you use or apply operational amplifiers for summing

C 256 C5-8 Do you use or apply operational amplifiers for unity gain amplifier (buffer)

C 257 C5-9 Do you use or apply operational amplifiers as active filters

C 258 C5-10 Do you use or apply operational amplifiers as oscillators

C 259 C5-11 Do you use or apply operational amplifiers as integrators

C 260 C5-12 Do you use or apply operational amplifiers for differentiators?

C 261 C5-13 Do you use or apply operational amplifiers for power supplies (voltage regulators)

C 262 C5-14 Do you use or apply operational amplifiers as analog/digital (A/D) digital/analog (D/A) converter

C 263 C5-15 Do you use or apply operational amplifiers as multivibrators

C 264 Do you use or apply operational amplifiers as modulators/demodulators

0133 30b. Isolate faulty Op Amps

C 250 C5-2 Do you troubleshoot to isolate a faulty op amp circuit

0134 31. Magnetic Amplifiers

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304 309 316 324 404 451 451 451 451 451 451 452 452 452
55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0135 31a. Theory of operation

C 265 C6-1 Do you trace block diagrams of circuits containing
magnetic amplifiers
C 266 C6-2 Do you trace schematic diagrams of magnetic
amplifier circuits
C 269 C6-5 Do you adjust magnetic amplifiers or components5 6 5 8 3 10 13 4 5 2 12 4 2 2
5 6 4 8 3 9 10 3 5 1 9 2 1 0
5 3 1 8 3 4 3 2 4 2 6 0 1 0

0136 31b. Isolate faulty magnetic amplifiers

C 267 C6-3 Do you troubleshoot to isolate a faulty magnetic
amplifier

5 4 3 7 4 6 10 3 3 1 6 0 2 0

0137 31c. Troubleshoot circuits

C 268 C6-4 Do you troubleshoot magnetic amplifiers to circuit
level components

5 3 1 8 3 4 3 2 2 2 9 0 1 1

0138 32. Saturable Reactors

0139 32a. Theory of operation

C 270 C6-6 Do you trace block diagrams of circuits containing
saturable reactors
C 271 C6-7 Do you trace schematic diagrams of saturable
reactor circuits
C 274 C6-10 Do you adjust saturable reactor circuits or components1 2 0 5 0 5 5 2 4 3 6 3 0 0
1 2 0 5 0 5 5 2 3 3 6 1 0 0
1 1 0 4 0 4 2 1 4 3 6 0 0 0

0140 32b. Isolate faulty saturable reactors

C 272 C6-8 Do you troubleshoot to isolate a faulty saturable
reactor

1 1 0 5 0 4 4 2 4 3 6 0 0 0

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304 309 316 324 404 451 451 451 451 451 451 451 452 452 452
55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0141 32c. Troubleshoot circuits

C 273 C6-9 Do you troubleshoot saturable reactors to circuit level components

1 1 0 5 0 3 2 1 4 3 6 0 0 0

0142 33. Power Supply Circuits (Half-wave, Full-wave, Full-wave bridge)

0143 33a. Theory of operation

0144 33a(1). Rectifiers (Half-wave, Full-wave, B Full-wave bridge)

D 275 D1-1 Do you trace block diagrams of circuits containing power supplies
D 276 D1-2 Do you trace schematic diagrams of power supply circuits
D 279 D1-5 Do you align or adjust power supplies
D 280 D1-6 Do you perform tasks on half-wave rectifier power supplies
D 281 D1-7 Do you perform tasks on full-wave rectifier power supplies
D 282 D1-8 Do you perform tasks on full-wave bridge rectifier power supplies
D 283 D1-9 Do you perform tasks on three-phase rectifier power supplies

86 89 63 93 75 94 91 82 93 95 76 61 51 58
86 84 57 94 72 89 84 71 94 90 71 42 44 25
85 85 56 94 54 82 88 76 93 94 68 3 2 3
68 50 27 89 35 42 41 28 51 59 56 6 9 9
75 55 32 90 41 44 46 31 57 68 56 7 7 9
81 59 35 89 43 45 46 30 55 71 53 6 12 11
16 34 13 47 15 30 34 25 30 41 44 6 2 7

0145 33a(2). Filters (Capacitive, Inductive, B L-Section, Pi-Section)

D 288 D2-1 Do you trace block diagrams of circuits containing power supply filters
D 289 D2-2 Do you trace schematic diagrams of power supply filters
D 292 D2-5 Do you perform tasks on capacitive power supply filters
D 293 D2-6 Do you perform tasks on inductive power supply filters
D 294 D2-7 Do you perform tasks on L-type power supply filters

68 65 28 80 19 68 61 45 57 65 56 12 7 21
68 63 27 79 20 57 54 34 55 60 50 8 4 7
65 58 25 78 21 43 43 23 38 56 38 3 2 4
50 48 17 69 16 38 36 19 32 52 38 2 2 4
28 39 9 46 8 29 25 12 22 35 38 2 0 1

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			55	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B	51C
D	295	D2-8 Do you perform tasks on Pi-type power supply filters	29	36	11	40	8	23	18	10	15	35	29	3	1	1
D	296	D2-9 Do you perform tasks on T-type power supply filters	20	28	8	39	4	20	13	8	13	27	26	2	0	0
D	297	D2-10 Do you perform tasks on resistive capacitive (RC) power supply filters	59	56	23	77	18	38	40	23	36	53	38	4	4	3
D	298	D2-11 Do you perform tasks on inductive capacitive (LC) power supply filters	54	51	14	70	16	36	38	19	29	49	38	3	4	3
0146		33b. Isolate faulty power supplies														
		2b														
D	277	D1-3 Do you troubleshoot circuits to isolate a faulty power supply	87	85	59	93	73	89	88	80	96	94	79	39	37	36
D	290	D2-3 Do you troubleshoot circuits to isolate a faulty power supply filter	66	58	23	78	18	54	48	26	52	59	50	2	2	11
0147		33c. Troubleshoot circuits														
		2b														
D	278	D1-4 Do you troubleshoot power supplies to circuit level components	85	70	41	92	55	48	45	34	67	71	44	7	10	7
D	291	D2-4 Do you troubleshoot power supply filters to circuit level components	63	55	20	75	16	30	20	12	34	47	32	2	0	3
0148		34. Voltage Regulators (Shunt, Series EVR, IC EVR)														
0149		34a. Theory of operation														
		B														
D	299	D3-1 Do you trace block diagrams of circuits containing power supply voltage regulators	78	75	40	91	32	74	68	69	71	74	68	20	16	17
D	300	D3-2 Do you trace schematic diagrams of power supply voltage regulator circuits	77	72	40	90	32	64	59	55	73	74	62	9	10	5
D	303	D3-5 Do you perform tasks on variable resistor power supply voltage regulators	72	59	27	84	29	50	52	35	60	67	47	2	7	4
D	304	D3-6 Do you perform tasks on zener diode power supply voltage regulators	67	63	27	87	23	48	48	26	54	63	50	3	7	4
D	305	D3-7 Do you perform tasks on transistor series power supply voltage regulators	67	53	23	84	19	35	32	27	45	51	41	2	2	4
D	306	D3-8 Do you perform tasks on IC power supply voltage regulators	58	51	25	75	13	28	26	19	27	43	24	2	0	2
D	307	D3-9 Do you perform tasks on pulse width modulator power supply voltage regulators	25	25	6	45	4	22	19	15	21	32	38	3	2	4

PRTMOD

Lowry TTC AFSCs matched to EF/A STS (1 of 3)

PM0036

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Task Title

D 308 D3-10 Do you perform tasks on transistor series power supply
voltage regulators with current limiting 304 309 316 324 404 451 451 451 451 451 451 452 452 452 452

D 309 D3-11 Do you perform tasks on crow bar power supply voltage
regulators 43 43 13 71 11 30 23 14 25 40 32 2 0 1
11 45 9 61 4 38 30 12 19 25 38 4 0 3

0150 34h. Isolate faulty voltage regulators 2b

D 301 D3-3 Do you troubleshoot circuits to isolate a faulty
power supply voltage regulator 78 68 37 90 31 60 54 58 68 74 68 3 6 4

0151 34c. Troubleshoot circuits 2b

D 302 D3-4 Do you troubleshoot power supply voltage regulators
to circuit level components 75 60 30 88 24 28 24 13 49 60 35 1 1 2

0152 35. Resistive/Capacitive/Inductive (RCL)
Circuits

0153 35a. Basic operation B

E 310 E1-1 Do you trace schematic or block diagrams of circuits
containing resistive capacitive inductive (RCL) circuits 59 64 19 73 13 43 35 24 32 47 41 16 13 7

0154 35b. Resonant operation B

E 312 E1-3 Do you trace schematic or block diagrams of circuits
containing resonant RCL circuits 53 56 15 68 11 35 32 19 24 42 32 11 9 5

0155 35c. Troubleshoot circuits 2b

E 311 E1-2 Do you troubleshoot RCL circuits to circuit level
components 57 57 15 71 11 21 21 10 27 41 26 2 9 1

E 313 E1-4 Do you troubleshoot resonant RCL circuits to
circuit level components 50 50 12 65 9 15 20 7 18 36 15 1 6 1

304 309 316 324 404 451 451 451 451 451 452 452 452

55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0156	35d. Calculations	B
E 314	El-5 Do you calculate values of impedance, voltage, or current in RCL circuits	15 17 8 44 4 11 10 6 13 14 9 2 2 1
E 315	El-6 Do you calculate phase angle of RCL circuits	10 12 4 31 2 6 7 4 9 12 9 1 1 1
E 316	El-7 Do you calculate values of power in RCL circuits	10 14 5 36 3 6 9 5 9 12 9 1 1 1
0157	36. Frequency Sensitive Filters (Low Pass, High Pass, Band Pass, Band Reject)	

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55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0161 36d. Calculations

E 321 E2-5 Do you calculate capacitance or inductance values for specific frequency sensitive filters

13 15 6 39 2 6 5 5 12 12 1 0 3

0162 37. Wave Generating Circuits

0163 37a. Theory of operation

0164 37a(1). Oscillators (LC, RC, Crystal) B

F 327	Fl-1	Do you trace block diagrams of circuits containing oscillators	73	76	36	84	15	58	63	45	51	82	50	34	10	36
F 328	Fl-2	Do you trace schematic diagrams of oscillator circuits	74	71	32	84	14	49	55	34	48	77	41	21	6	12
F 331	Fl-5	Do you align or adjust oscillator circuits	72	64	28	84	7	35	40	30	39	71	41	2	0	0
F 332	Fl-6	Do the oscillators you work with use LC tank circuits	60	50	17	77	10	29	37	18	35	49	35	3	2	1
F 333	Fl-7	Do the oscillators you work with use RC networks	60	49	21	81	7	30	35	20	32	53	32	8	2	1
F 334	Fl-8	Do the oscillators you work with use crystals	66	72	33	81	5	35	45	35	36	61	35	10	1	4
F 335	Fl-9	Do the oscillators you work with use phase lock loops (PLL)	41	64	25	63	2	19	38	33	10	49	32	10	1	4
F 336	Fl-10	Do you perform tasks on series Hartley oscillator circuits	36	26	5	58	3	12	10	6	12	20	24	1	0	0
F 337	Fl-11	Do you perform tasks on shunt Hartley oscillator circuits	35	25	6	53	4	13	10	6	14	21	24	2	0	0
F 338	Fl-12	Do you perform tasks on Colpitts oscillator circuits	34	26	5	61	4	9	12	4	8	26	24	2	0	0
F 339	Fl-13	Do you perform tasks on Clapp oscillator circuits	9	13	0	33	2	6	7	4	6	9	12	1	0	0
F 340	Fl-14	Do you perform tasks on voltage control oscillators (VCO)/VTD	49	53	29	75	4	23	40	26	14	64	35	6	2	1
F 341	Fl-15	Do you perform tasks on crystal oscillator circuits	62	61	24	78	4	28	30	24	27	51	32	6	0	2
F 342	Fl-16	Do you perform tasks on Wien bridge oscillator circuits	20	16	4	73	1	9	9	3	10	21	24	1	1	0
F 343	Fl-17	Do you perform tasks on pulse generating oscillator circuits	41	39	10	62	5	23	25	16	20	36	35	8	2	3
F 344	Fl-18	Do you perform tasks on blocked/blocking oscillator circuits	30	13	1	36	2	9	7	3	7	10	26	0	0	0
F 345	Fl-19	Do you perform tasks on burst generators	48	6	1	39	1	6	8	4	11	13	26	2	0	1
F 346	Fl-20	Do you perform tasks on RC phase shift oscillators	30	22	6	51	3	20	21	10	15	31	29	5	2	1

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55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0165 37a(2). Multivibrators (Astable, Bistable, B Monostable)

- F 347 F2-1 Do you trace block diagrams of circuits containing multivibrators
- F 348 F2-2 Do you trace schematic diagrams of multivibrator circuits
- F 351 F2-5 Do you adjust or align multivibrator circuits
- F 352 F2-6 Do the multivibrators you work with use LC tank circuits
- F 353 F2-7 Do the multivibrators you work with use RC networks
- F 354 F2-8 Do the multivibrators you work with use Crystals
- F 355 F2-9 Do you perform tasks on astable (free running) multivibrators
- F 356 F2-10 Do you perform tasks on monostable (one shot) multivibrators
- F 357 F2-11 Do you perform tasks on bistable (flip flop) multivibrators
- F 358 F2-12 Do you perform tasks on triggered astable multivibrators

0166 37a(3). Waveshaping Circuits (Schmitt Trigger, Sawtooth, RC Integ/Diff) B

- F 359 F3-1 Do you trace block diagrams of circuits containing waveshaping circuits (WSC)
- F 360 F3-2 Do you trace schematic diagrams of WSC
- F 363 F3-5 Do you adjust or calibrate WSC
- F 364 F3-6 Do you perform tasks on sawtooth wave generator WSC
- F 365 F3-7 Do you perform tasks on trapezoidal (ramp) wave generator WSC
- F 366 F3-8 Do you perform tasks on RC differentiating WSC
- F 367 F3-9 Do you perform tasks on RL differentiating WSC
- F 368 F3-10 Do you perform tasks on RC integrating WSC
- F 369 F3-11 Do you perform tasks on RL integrating WSC
- F 370 F3-12 Do you perform tasks on square wave generator WSC
- F 371 F3-13 Do you perform tasks on rectangular wave generator WSC
- F 372 F3-14 Do you perform tasks on Schmitt trigger WSC

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55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0167 37b. Isolate faulty wave generating circuits 2b

- F 329 F1-3 Do you troubleshoot to isolate a faulty oscillator circuit
F 349 F2-3 Do you troubleshoot to isolate a faulty multivibrator circuit
F 361 F3-3 Do you troubleshoot to isolate a faulty WSC

73 68 27 83 11 45 51 32 48 75 41 15 4 7
57 45 16 75 10 30 26 14 38 52 32 2 2 3
60 45 11 70 6 34 25 17 39 47 35 2 1 0

0168 37c. Troubleshoot circuits 2b

- F 330 F1-4 Do you troubleshoot oscillators to circuit level components
F 350 F2-4 Do you troubleshoot multivibrators to circuit level components
F 362 F3-4 Do you troubleshoot WSC to circuit level components

70 59 21 80 6 21 26 11 32 49 26 3 0 0
56 40 11 71 7 12 12 7 26 39 15 2 0 1
60 41 8 67 3 13 10 6 30 37 15 2 0 0

0169 38. Limiter Circuits (Diode, Zener Diode, Transistor)

0170 38a. Theory of operation B

- F 373 F4-1 Do you trace block diagrams of circuits containing limiters
F 374 F4-2 Do you trace schematic diagrams of limiter circuits
F 381 F4-9 Do you perform tasks on series diode limiter circuits
F 382 F4-10 Do you perform tasks on shunt diode limiter circuits
F 383 F4-11 Do you perform tasks on bias limiter circuits
F 384 F4-12 Do you perform tasks on zener diode circuits
F 385 F4-13 Do you perform tasks on transistor limiter circuits
F 386 F4-14 Do you perform tasks on triode limiter circuits

62 53 8 71 8 53 35 28 39 51 44 8 5 2
63 50 8 69 8 45 30 19 37 48 35 5 4 0
54 34 5 65 5 35 22 14 30 40 26 0 1 0
48 36 4 65 4 35 20 15 27 40 26 1 0 0
40 30 3 55 3 30 13 11 24 33 26 0 0 0
62 46 9 70 7 37 28 16 35 48 35 1 2 0
57 32 6 64 5 29 19 12 26 34 26 1 1 0
22 13 2 43 0 16 7 7 13 21 12 0 0 0

0171 38b. Isolate faulty limiters 2b

- F 377 F4-5 Do you troubleshoot to isolate a faulty limiter circuit

60 43 7 67 5 33 20 13 33 45 32 1 2 0

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0172 38c. Troubleshoot circuits

2b

F 378 F4-6 Do you troubleshoot limiters to circuit level
components

58 40 5 66 4 13 10 6 26 38 15 1 1 0

0173 39. Clamper Circuits

0174 39a. Theory of operation

B

F 375 F4-3 Do you trace block diagrams of circuits containing
claspers

62 49 6 68 8 43 23 20 35 47 38 2 1 0

F 376 F4-4 Do you trace schematic diagrams of clamper circuits

64 46 6 67 6 40 22 16 35 44 35 2 0 0

F 387 F4-15 Do you perform tasks on diode clamper circuits

61 43 5 63 5 33 18 15 27 42 29 0 0 0

F 388 F4-16 Do you perform tasks on bias clamper circuits

39 26 1 54 3 26 13 12 22 34 24 0 0 0

0175 39b. Isolate faulty claspers

2b

F 379 F4-7 Do you troubleshoot to isolate a faulty clamper circuit

62 41 4 65 5 28 14 9 30 40 26 1 0 0

0176 39c. Troubleshoot circuits

2b

F 380 F4-8 Do you troubleshoot claspers to circuit level
components

60 39 3 64 3 12 9 5 24 36 15 0 0 0

0177 40. Digital Numbering Systems (Binary,
Octal, Hexadecimal)

0178 40a. Conversions

B

G 389 G1-1 Do you convert decimal numbers to binary numbers or
binary numbers to decimal

26 64 37 47 8 91 63 67 60 51 62 66 21 32

G 390 G1-2 Do you convert octal numbers to binary or binary
numbers to octal

13 44 25 37 4 91 50 66 49 49 59 62 18 20

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
G	391	G1-3 Do you convert hexadecimal numbers to binary or binary numbers to hexadecimal	17	53	24	38	3	92	41	62	56	42	56	38	12	12
G	392	G1-4 Do you convert octal numbers to decimal or decimal numbers to octal	13	44	24	36	3	88	43	61	46	45	56	42	15	14
G	393	G1-5 Do you convert hexadecimal numbers to decimal or decimal numbers to hexadecimal	16	50	24	37	3	89	37	61	57	41	56	35	9	12
G	394	G1-6 Do you convert octal numbers to hexadecimal or hexadecimal numbers to octal	12	36	17	32	2	90	36	57	41	38	56	35	10	10
G	395	G1-7 Do you convert base number fractions to another base numbering system	11	28	11	31	3	48	23	28	30	27	29	26	7	9

0179 40b. Math operations

G 396	G1-8 Do you add binary numbers	17	41	22	38	6	78	41	49	45	44	38	26	9	18
G 397	G1-9 Do you subtract binary numbers	17	39	21	38	6	71	37	47	40	42	38	20	10	14
G 398	G1-10 Do you multiply binary numbers	13	25	12	27	4	48	23	27	25	27	29	12	5	8
G 399	G1-11 Do you divide binary numbers	13	23	11	26	3	45	22	26	23	27	26	11	5	7
G 400	G1-12 Do you add octal numbers	10	31	14	28	3	76	29	45	30	36	29	17	6	7
G 401	G1-13 Do you subtract octal numbers	10	30	12	28	3	70	27	42	30	36	29	16	6	5
G 402	G1-14 Do you add hexadecimal numbers	11	32	16	27	1	65	20	38	34	30	21	14	6	4
G 403	G1-15 Do you subtract hexadecimal numbers	10	30	14	27	1	59	20	35	35	30	21	14	6	4

0180 40c. Binary Code Systems

G 404	G1-16	Do you use binary coded decimal (BCD)
G 405	G1-17	Do you use gray codes
G 406	G1-18	Do you use ICAO codes
G 407	G1-19	Do you use excess-3 (XS3) codes
G 408	G1-20	Do you use parity bit codes
G 409	G1-21	Do you use biquinary codes
G 410	G1-22	Do you use ASCII codes
G 411	G1-23	Do you use EBCDI codes

0181 41. Digital Logic Functions (Main Logic Gate', and Flip-Flops)

0182 42a. Theory of operation

	6 41-	6 413	61-24	Do you trace data flow through logic symbol diagrams	61-25	Do you trace data flow through logic schematic diagrams										
			42	76	31	68	11	86	63	55	78	75	62	57	27	33
			44	77	32	68	11	84	60	50	77	75	59	51	27	27

D	Tsk	Task Title	304	309	316	324	404	451	451	451	451	451	452	452	452
Y	Nbr		55	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B
G 417		G1-29 Do you trace data flow through circuits using positive logic (High = Binary 1)	40	74	28	65	6	74	50	36	68	71	47	25	17
G 418		G1-30 Do you trace data flow through circuits using negative logic (High = Binary 0)	33	53	21	60	6	65	43	33	64	66	47	22	16
G 419		G1-31 Do you perform tasks related to AND gates	55	78	38	72	15	84	62	54	85	79	62	26	34
G 420		G1-32 Do you perform tasks related to OR gates	54	78	38	72	15	84	62	54	84	79	62	26	34
G 421		G1-33 Do you perform tasks related to inhibited gates logic functions	49	72	24	68	6	73	53	48	80	77	50	24	24
G 422		G1-34 Do you perform tasks related to NAND or NOR gates	53	76	35	71	13	81	60	52	83	79	62	26	32
G 423		G1-35 Do you perform tasks related to exclusive OR/NOR logic functions	50	73	30	67	9	79	52	49	76	75	62	23	18
G 424		G1-36 Do you perform tasks related to RS flip flops	41	63	16	59	5	74	43	42	74	65	50	8	5
G 425		G1-37 Do you perform tasks related to D(Data) flip flops	37	65	21	59	7	70	32	34	57	54	50	9	2
G 426		G1-38 Do you perform tasks related to T(Toggle) flip flops	37	60	17	59	7	62	35	33	60	55	44	7	2
G 427		G1-39 Do you perform tasks related to JK flip flops	45	71	24	63	5	77	48	38	77	69	50	7	0
G 428		G1-40 Do you perform tasks related to Schmidt triggers	39	52	21	64	7	46	33	25	46	53	50	5	0
G 429		G1-41 Do you perform tasks related to delay (One-shot) logic functions	33	53	21	58	6	43	34	33	44	54	47	8	7
G 430		G1-42 Do you perform tasks related to open collector gates (wired "AND" or wired "OR")	28	55	16	47	3	40	23	19	32	43	41	7	6
G 431		G1-43 Do you perform tasks related to buffers	44	68	28	66	4	65	38	35	54	64	59	10	8
G 432		G1-44 Do you perform tasks related to inverters	49	72	31	68	7	67	46	38	66	71	59	10	15
G 433		G1-45 Do you perform tasks related to complemented flip flops	25	36	11	43	3	37	21	20	30	34	41	6	0
G 434		G1-46 Do you perform tasks related to complementing flip flops	25	36	10	43	3	36	22	20	30	34	41	5	0
0183		41b. Isolate faulty logic function circuits													
G 414		G1-26 Do you troubleshoot digital systems to major units	41	78	29	64	11	76	52	56	70	71	59	51	22
G 415		G1-27 Do you troubleshoot digital systems subassemblies or circuit cards	43	78	29	66	11	70	45	45	71	72	47	7	1
0184		41c. Troubleshoot circuits													
G 416		G1-28 Do you troubleshoot digital systems, subsystems or circuit cards to circuit level components or IC	42	72	26	65	7	48	31	18	55	64	41	6	1
0185		41d. Logic families (TTL and CMOS)													
G 438		G1-50 Do you perform tasks on RTL (resistor transistor logic formally DCTL)	23	36	11	45	4	30	15	16	26	33	32	3	0
G 439		G1-51 Do you perform tasks on DTL (diode transistor logic)	30	33	11	48	5	36	17	18	29	33	32	3	0

D
Task
Y Nbr

Task Title

304 309 316 324 404 451 451 451 451 451 451 451 452 452 452
55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C
38 68 31 67 8 57 30 32 38 54 53 3 0 2
13 18 6 35 4 26 12 22 20 27 38 1 0 1
7 10 3 25 2 14 5 6 8 12 26 2 0 1
29 39 24 49 7 30 25 21 21 39 35 1 0 2
14 23 4 27 2 17 11 11 13 25 26 2 0 1
13 16 4 27 0 16 9 10 13 20 26 3 0 1
6 7 2 18 0 14 5 6 10 10 15 2 0 1

G 440 G1-52 Do you perform tasks on TTL (transistor transistor logic)
G 441 G1-53 Do you perform tasks on ECL/CHL (emitter coupled or current mode logic)
G 442 G1-54 Do you perform tasks on HTL (high threshold logic)
G 443 G1-55 Do you perform tasks on CMOS (complementary metal oxide semiconductor)
G 444 G1-56 Do you perform tasks on positive MOS ICs
G 445 G1-57 Do you perform tasks on negative MOS ICs
G 446 G1-58 Do you perform tasks on vertical MOS ICs

0186 42. Boolean Equations

0187 42a. Diagram to equation B

G 435 G1-47 Do you develop Boolean equations from logic circuits or diagrams

9 24 9 25 3 30 17 13 26 27 21 10 5 5

0188 42b. Equation to diagram B

G 436 G1-48 Do you develop logic diagrams from Boolean equations

8 17 8 22 3 26 16 12 21 23 21 8 4 4

0189 42c. Simplify Expressions -

G 437 G1-49 Do you simplify Boolean expressions using Boolean algebra

9 21 8 23 3 23 18 15 21 25 21 10 5 4

0190 43. Computers

0191 43a. Operation principles B

G 447 G2-1 Do you trace block or schematic diagrams of computer controlled or computer based systems
G 454 G2-8 Do you perform tasks on analog computers
G 455 G2-9 Do you perform tasks on digital computers

19 61 25 35 82 43 75 48 46 68 62 32 32
8 21 7 19 3 57 24 27 41 32 18 33 22 21
21 65 47 35 6 87 45 82 54 47 68 55 24 30

[illegible]

D	T	Task Title	304	309	316	324	404	451	451	451	451	451	451	452	452	452
Y	Nbr		55	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B	51C
G 473		G2-27 Do you perform tasks on microprocessor computer terminals	10	34	32	19	2	18	10	42	21	19	53	10	4	4
G 474		G2-28 Do you perform tasks on video display unit (VDU/monitors)	24	44	33	18	3	57	25	65	22	29	62	29	7	10
G 475		G2-29 Do you perform tasks on paper tape readers/punches	1	20	5	4	1	64	38	39	19	45	9	6	0	5
G 476		G2-30 Do you perform tasks on paper card readers/punches	1	4	5	4	1	8	3	8	14	6	3	4	0	2
G 477		G2-31 Do you perform tasks on toggle or push button switch inputs	11	34	15	14	3	66	27	43	29	40	38	24	9	5
G 478		G2-32 Do you perform tasks on incandescent displays (Nixie tubes, LEDs, LCDs)	14	42	16	26	3	57	15	38	35	34	41	28	5	5
G 479		G2-33 Do you perform tasks on modems	7	40	14	5	3	4	2	4	6	7	47	4	1	4
G 480		G2-34 Do you perform tasks on line printers	10	44	37	11	4	29	27	41	21	19	59	8	4	7
G 481		G2-35 Do you perform tasks on floppy disc drives	17	49	43	18	5	11	7	6	14	13	26	8	1	3
G 482		G2-36 Do you perform tasks on removable cartridge disc drives	7	15	17	10	1	7	38	78	10	20	59	5	0	3
G 483		G2-37 Do you perform tasks on removable pack disc drives	2	21	14	3	1	5	4	10	4	7	41	5	0	2
G 484		G2-38 Do you perform tasks on fixed Winchester type disc drives	7	21	24	7	3	5	10	10	9	8	21	4	0	4

0198 43h. Programming languages

G 456		G2-10 Do you use Basic computer language	16	24	29	35	11	13	12	9	11	16	44	9	5	7
G 457		G2-11 Do you use COBOL computer language	0	2	4	4	1	3	2	2	4	1	3	2	0	4
G 458		G2-12 Do you use FORTRAN computer language	0	8	14	4	3	4	4	4	3	3	6	2	0	2
G 459		G2-13 Do you use ADA computer language	0	1	1	2	1	1	2	3	2	1	3	1	0	1
G 460		G2-14 Do you use ATLAS computer language	0	0	0	5	2	68	41	88	21	31	68	2	0	1
G 461		G2-15 Do you use ELAN computer language	0	0	0	3	1	2	34	1	2	1	3	1	0	1
G 462		G2-16 Do you use PASCAL computer language	0	1	6	4	2	4	2	2	6	2	6	2	0	2
G 463		G2-17 Do you use RPG computer language	0	0	0	2	1	1	1	3	1	1	3	1	0	2
G 464		G2-18 Do you use Machine computer language	5	19	8	16	2	36	15	16	18	7	44	3	0	3
G 465		G2-19 Do you use C computer language	1	1	5	2	2	1	1	2	2	1	3	2	0	1

0199 44. Microprocessor Controlled Systems

0200 44a. Theory of operation B

G 485		G2-39 Do you trace block or schematic diagrams of microprocessor controlled systems	17	49	17	43	4	35	24	53	20	29	53	13	2	13
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PRTHOD Lowry TTC AFSCs matched to EF/A STS (1 of 3)

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D
T Task
Y Nbr

Task Title

304 309 316 324 404 451 451 451 451 451 451 451 452 452 452
55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0201 44b. Isolate faulty microprocessors 2b

G 486 G2-40 Do you troubleshoot microprocessor controlled
systems to a subassembly or circuit card
G 487 G2-41 Do you troubleshoot microprocessor controlled
systems to isolate a faulty microprocessor

16 48 13 42 4 34 24 48 21 28 44 2 0 3
15 43 9 39 2 24 12 17 15 18 24 2 1 3

0202 45. Logic Circuits

0203 45a. Theory of operation

0204 45a(1). Counters (Synchronous/
Asynchronous-Up/Down counters) B

G 488 G3-1 Do you trace data flow through circuits containing
counters
G 491 G3-4 Do you perform tasks on UP counters in logic circuits
G 492 G3-5 Do you perform tasks on DOWN counters in logic
circuits
G 493 G3-6 Do you perform tasks on DECADE counters in logic
circuits
G 494 G3-7 Do you perform tasks on ring counters in logic
circuits
G 495 G3-8 Do you perform tasks on modulus counters in logic
circuits
G 496 G3-9 Do you perform tasks on synchronous (parallel) counters
in logic circuits
G 497 G3-10 Do you perform tasks on asynchronous (serial) counters
in logic circuits

31 66 22 61 11 62 45 36 52 54 56 12 15 4
29 55 21 55 9 58 38 28 49 51 38 4 2 1
28 50 19 52 9 59 38 28 48 49 38 2 0 0
17 38 15 57 5 48 24 19 38 37 29 1 0 0
9 28 4 28 1 14 11 6 14 14 26 2 0 0
10 23 2 16 1 11 7 8 12 10 12 0 0 0
17 46 14 45 4 45 29 25 33 34 38 2 1 1
18 47 13 45 4 45 28 23 33 36 38 2 1 1

0205 45a(2). Registers (Shift and Storage) B

G 498 G3-11 Do you trace logic diagrams of circuits containing
registers
G 501 G3-14 Do you perform tasks on shift registers in logic
circuits

23 61 17 36 4 62 40 34 45 44 50 5 2 3
22 54 19 33 2 53 33 32 46 44 44 1 1 1

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 G 502 G3-15 Do you perform tasks on storage registers in logic circuits
 304 309 316 324 404 451 451 451 451 451 451 452 452 452 452
 55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C
 22 52 15 33 2 55 32 30 43 42 44 2 1 1

0206 45a(3). Combinational Logic Circuits B

(Half-adder, Full-adder, encoder, Decoder, Multiplexer, Demultiplexer, Count Detect)

G 503 G3-16 Do you trace data flow through combinational logic circuits
 26 54 16 33 1 43 29 25 35 47 50 9 1 5
 G 506 G3-19 Do you perform tasks on encoders
 36 55 16 36 3 45 26 23 41 53 56 5 0 5
 G 507 G3-20 Do you perform tasks on decoders
 35 57 15 36 4 45 26 24 43 55 56 5 0 5
 G 508 G3-21 Do you perform tasks on multiplexers
 26 50 18 33 1 50 27 26 40 44 53 7 1 2
 G 509 G3-22 Do you perform tasks on demultiplexers
 18 46 16 26 1 43 23 23 30 38 47 4 0 1
 G 510 G3-23 Do you perform tasks on comparators
 23 55 12 33 1 46 26 24 27 46 53 3 1 2
 G 511 G3-24 Do you perform tasks on parity generators or checkers
 10 34 7 20 0 43 15 16 22 27 53 2 0 2
 G 512 G3-25 Do you perform tasks on code converters
 9 29 8 18 0 23 11 9 17 21 32 1 0 0
 G 513 G3-26 Do you perform tasks on adders
 18 37 5 30 1 36 18 13 26 25 44 5 0 2
 G 514 G3-27 Do you perform tasks on subtractors
 13 31 5 28 1 33 16 12 24 23 44 5 0 2
 G 515 G3-28 Do you perform tasks on count detect circuits
 11 21 3 17 0 25 10 6 11 10 18 0 0 1

0207 45b. Isolate faulty circuits 2b

G 489 G3-2 Do you troubleshoot counter circuits to isolate a faulty counter
 29 59 19 61 12 46 35 22 47 50 41 3 12 1
 G 499 G3-12 Do you troubleshoot circuits containing registers to isolate a faulty register
 22 53 16 33 3 45 34 17 44 39 41 1 0 1
 G 504 G3-17 Do you troubleshoot to isolate a faulty combinational logic circuit
 25 50 15 32 1 14 24 16 34 43 41 2 0 0

0208 45c. Troubleshoot circuits

G 490 G3-3 Do you troubleshoot counters to circuit level components
 27 54 17 59 8 28 16 8 36 42 12 1 4 0
 G 500 G3-13 Do you troubleshoot registers to circuit level components
 21 46 14 30 2 28 15 5 30 31 15 0 0 1
 G 505 G3-13 Do you troubleshoot combinational logic circuits to circuit level components
 24 43 11 30 0 23 10 6 27 34 15 2 0 0

304 309 316 324 404 451 451 451 451 451 451 451 452 452 452
55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

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0209 46. D/A, A/D Converters (Approx D/A and Ramp A/D)

0210 46a. Theory of operation B

G 516 G4-1 Do you trace data flow through A/D converters
G 517 G4-2 Do you trace data flow through D/A converters
G 520 G4-5 Do the converters you perform tasks on use flash conversion
G 521 G4-6 Do the converters you perform tasks on use successive approximation conversion
G 522 G4-7 Do the converters you perform tasks on use ramp conversion
G 523 G4-8 Do the converters you perform tasks on use R2R conversion

0211 46b. Isolate faulty converters 2b

G 518 G4-3 Do you troubleshoot A/D converter circuits
G 519 G4-4 Do you troubleshoot D/A converter circuits

0212 47. Transmission Lines

0213 47a. Theory of operation B

H 527 H1-4 Do you construct transmission lines
H 528 H1-5 Do you match transmission line impedance with loads
H 531 H1-8 Do you perform tasks on open-wire transmission lines
H 532 H1-9 Do you perform tasks on twisted pair transmission lines
H 533 H1-10 Do you perform tasks on twin lead transmission lines
H 534 H1-11 Do you perform tasks on flexible coaxial transmission lines
H 535 H1-12 Do you perform tasks on rigid coaxial transmission lines
H 536 H1-13 Do you perform tasks on fiber-optic transmission lines

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55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0214 47b. Perform Measurements

2b

H 524 H1-1 Do you measure electrical length on transmission lines
H 525 H1-2 Do you measure physical length on transmission lines
H 526 H1-3 Do you measure standing wave ratio (SWR) on transmission lines

12 18 17 20 0 16 9 6 4 5 15 20 2 23
26 25 31 21 1 22 10 6 7 8 21 33 2 36
13 24 14 43 0 9 18 18 7 18 32 22 1 54

0215 47c. Calculations

H 529 H1-6 Do you calculate the characteristic impedance (ZO) of transmission lines

9 8 6 24 0 6 4 4 4 3 12 9 2 14

0216 47d. Isolate faulty transmission lines

H 530 H1-7 Do you troubleshoot transmission lines

34 36 30 25 0 21 20 15 13 22 26 42 9 59

0217 48. Waveguides

0218 48a. Theory of operation

B

H 537 H1-14 Do you trace schematic or block diagrams of circuits containing waveguides
H 539 H1-16 Do you pressurize or purge waveguide assemblies
H 540 H1-17 Do you measure standing wave ratio for waveguide assemblies
H 541 H1-18 Do you remove or install waveguide or associated coupling hardware components

7 26 8 45 2 78 85 46 41 34 53 87 21 67
4 15 2 12 1 62 63 42 38 10 44 92 21 78
1 11 3 42 1 21 38 28 17 18 35 26 4 30
5 19 6 47 1 72 78 49 40 34 44 92 20 83

0219 48b. Isolate faulty waveguides

2b

H 538 H1-15 Do you troubleshoot circuits to isolate a faulty waveguide assembly

4 23 4 41 1 74 80 44 39 32 50 82 18 64

D
T Tsk
Y Nbr

Task Title

304 309 316 324 404 451 451 451 451 451 451 452 452 452 452
55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0220 49. Microwave Oscillators & Amplifiers

0221 49a. Theory of operation B

H 542	H2-1 Do you trace schematic or block diagrams of circuits containing microwave oscillators or amplifiers	6	30	6	57	1	59	63	34	34	48	53	41	6	27
H 545	H2-4 Do you perform tasks on two-cavity klystron microwave oscillators and amplifiers	0	2	0	37	0	2	4	2	13	3	6	2	0	0
H 546	H2-5 Do you perform tasks on three-cavity klystron microwave oscillators and amplifiers	0	10	0	28	0	1	4	1	7	3	0	3	0	0
H 547	H2-6 Do you perform tasks on reflex klystron microwave oscillators and amplifiers	0	3	0	44	0	6	6	2	24	7	9	4	0	0
H 548	H2-7 Do you perform tasks on traveling wave tube microwave oscillators and amplifiers	0	15	2	44	0	27	54	27	26	45	38	19	4	2
H 549	H2-8 Do you perform tasks on magnetron microwave oscillators and amplifiers	0	2	0	28	0	9	20	9	35	5	29	11	2	2
H 550	H2-9 Do you perform tasks on backward wave oscillator	0	0	0	36	0	5	8	2	27	37	3	2	0	0
H 551	H2-10 Do you perform tasks on parametric amplifiers	0	3	4	13	0	23	4	2	4	6	0	7	0	0
H 552	H2-11 Do you perform tasks on yttrium iron garnet (YIG) tuned microwave oscillators and amplifiers	0	2	1	48	1	3	34	23	12	39	29	3	2	3

0222 49b. Tune or Adjust 2b

H 544	H2-3 Do you tune or adjust microwave oscillators or amplifiers	8	23	4	57	1	46	45	19	32	45	41	6	0	2
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0223 49c. Isolate faulty microwave oscillators 2b or amplifiers

H 543	H2-2 Do you troubleshoot circuits to isolate a faulty microwave oscillator or amplifier	4	27	5	56	1	54	57	28	33	47	41	30	4	17
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0224 50. Resonant Cavities

D	T Task	Task Title	304	309	316	324	404	451	451	451	451	451	451	452	452	452
Y Nbr			55	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B	51C

0225	50a. Theory of operation	B														
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H 553	H3-1 Do you trace schematic or block diagrams of circuits containing resonant cavities	4	19	2	40	0	9	14	12	17	30	21	3	0	1	
H 558	H3-6 Do you perform tasks on probe resonant cavities	3	10	1	26	0	3	4	3	6	10	3	0	1	0	
H 559	H3-7 Do you perform tasks on loop resonant cavities	2	4	2	18	0	0	3	3	5	10	3	0	0	0	
H 560	H3-8 Do you perform tasks on aperture (iris/window) resonant cavities	2	7	0	7	0	3	5	3	4	4	6	0	0	0	

0226	50b. Isolate faulty resonant cavities	2b														
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H 554	H3-2 Do you troubleshoot circuits to isolate a faulty resonant cavity	3	15	1	38	0	6	12	5	14	25	15	0	0	0	
H 557	H3-5 Do you measure frequency of resonant cavity?	3	14	2	39	0	4	10	5	14	18	15	0	0	0	

0227	50c. Tune/adjust	2b														
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H 555	H3-3 Do you tune or adjust resonant cavities electrically	5	10	1	37	0	3	12	6	14	21	18	0	0	0	
H 556	H3-4 Do you tune or adjust resonant cavities physically	3	13	3	37	0	3	14	4	15	16	15	0	0	0	

0228	51. Transmitters															
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0229	51a. Theory of operation															
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0230	51a(1). Amplitude Modulation															
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H 561	H4-1 Do you use "AM" modulation principles	14	25	8	61	1	13	38	49	12	53	44	8	0	21	
H 562	H4-2 Do you trace block diagrams of AM transmitters	12	21	5	50	1	10	41	52	10	55	38	8	2	25	
H 563	H4-3 Do you trace block diagrams of AM transmitter subassemblies or circuit cards	13	18	3	48	1	10	38	49	10	55	38	3	2	7	
H 564	H4-4 Do you trace schematic diagrams of AM transmitter subassemblies or circuit cards	13	15	2	44	1	9	34	35	9	51	32	2	1	3	
H 568	H4-8 Do you align or adjust AM transmitters or circuits	12	15	3	52	1	6	37	51	8	52	29	2	1	3	
H 569	H4-9 Do you calculate percentage of modulation for AM transmitters	8	10	5	61	1	4	26	44	4	46	18	1	1	3	

D
T Task
Y Nbr Task Title

0231 51a(2). Frequency Modulation

H 593 H4-33 Do you use "FM" modulation principles
H 594 H4-34 Do you trace block diagrams of FM transmitters
H 595 H4-35 Do you trace block diagrams of FM transmitter subassemblies or circuit cards
H 596 H4-36 Do you trace schematic diagrams of FM transmitter subassemblies or circuit cards
H 600 H4-40 Do you align or adjust FM transmitters or circuits
H 601 H4-41 Do you calculate modulation index for FM transmitters
H 602 H4-42 Do you measure frequency deviation for FM transmitters

0232 51a(3). Single Side Band

H 578 H4-18 Do you trace block diagrams of single side band (SSB) transmitters
H 579 H4-19 Do you trace block diagrams of SSB transmitter subassemblies or circuit cards
H 580 H4-20 Do you trace schematic diagrams of SSB transmitter subassemblies or circuit cards
H 584 H4-24 Do you align or adjust SSB transmitters or circuits
H 585 H4-25 Do you calculate percentage of modulation for SSB transmitters

0233 51a(4). Pulse Modulation

H 612 H4-52 Do you use "PM" modulation principles
H 613 H4-53 Do you trace block diagrams of PM transmitters
H 614 H4-54 Do you trace block diagrams of PM transmitter subassemblies or circuit cards
H 615 H4-55 Do you trace schematic diagrams of PM transmitter subassemblies or circuit cards
H 619 H4-59 Do you align or adjust PM transmitters or circuits
H 620 H4-60 Do you calculate pulse recurrence time (PRT) or pulse recurrence frequency (PRF) for PM transmitters
H 621 H4-61 Do you measure PRT, PRF or pulse width for PM transmitters

D
 T Task
 Y Nbr Task Title
 304 309 316 324 404 451 451 451 451 451 451 451 452 452 452
 55 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0234 51b. Isolate faulty transmitters

H 565 H4-5 Do you troubleshoot AM transmitters to major units
 H 566 H4-6 Do you troubleshoot AM transmitters to
 subassemblies or circuit cards
 H 581 H4-21 Do you troubleshoot SSB transmitters to major units
 H 582 H4-22 Do you troubleshoot SSB transmitters to
 subassemblies or circuit cards
 H 597 H4-37 Do you troubleshoot FM transmitters to major units
 H 598 H4-38 Do you troubleshoot FM transmitters to sub-
 assemblies or circuit cards
 H 616 H4-55 Do you troubleshoot PM transmitters to major units
 H 617 H4-57 Do you troubleshoot PM transmitters to sub-
 assemblies or circuit cards

0235 51c. Troubleshoot circuits

H 567 H4-7 Do you troubleshoot AM transmitter subassemblies
 or circuit cards to circuit level components
 H 583 H4-23 Do you troubleshoot SSB transmitter subassemblies
 or circuit cards to circuit level components
 H 599 H4-34 Do you troubleshoot FM transmitter subassemblies
 or circuit cards to circuit level components
 H 618 H4-58 Do you troubleshoot PM transmitter subassemblies
 or circuit cards to circuit level components

0236 52. Receivers

0237 52a. Theory of operation

0238 52a(1). Amplitude Modulation

H 570 H4-10 Do you use "AM" demodulation principles
 H 571 H4-11 Do you trace block diagrams of AM receivers
 H 572 H4-12 Do you trace block diagrams of AM receiver
 subassemblies or circuit cards

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	X7	452 51A	452 51B	452 51C
		H4-13 Do you trace schematic diagrams of AM receiver subassemblies or circuit cards	19	36	6	30	0	8	29	36	4	45	32	0	1	4
		H4-17 Do you align or adjust AM receivers or circuits	19	34	9	34	0	6	29	43	5	45	26	1	1	5
0239		52a(2). Frequency Modulation														
		H4-43 Do you use "FM" demodulation principles	22	47	24	35	0	11	22	37	9	28	47	14	2	16
		H4-44 Do you trace block diagrams of FM receivers	25	48	22	32	0	15	33	49	8	32	47	20	4	33
		H4-45 Do you trace block diagrams of FM receiver subassemblies or circuit cards	25	47	16	31	0	14	30	49	8	32	44	6	1	9
		H4-46 Do you trace schematic diagrams of FM receiver subassemblies or circuit cards	25	44	14	30	0	12	27	37	8	30	41	2	0	4
		H4-50 Do you align or adjust FM receivers or circuits	25	43	18	33	0	11	26	48	9	29	44	1	0	5
		H4-51 Do you plot receiver signal level curves (RSL) for FM receivers	5	17	7	15	0	4	5	6	3	14	9	1	0	0
0240		52a(3). Single Side Band														
		H4-26 Do you trace block diagrams of SSB receivers	5	8	3	6	0	5	17	8	5	38	18	2	1	10
		H4-27 Do you trace block diagrams of SSB receiver subassemblies or circuit cards	5	7	2	6	0	5	15	7	5	38	18	1	0	3
		H4-28 Do you trace schematic diagrams of SSB receiver subassemblies or circuit cards	5	7	2	6	0	5	11	6	4	38	18	0	0	1
		H4-32 Do you align or adjust SSB receivers or circuits	5	7	2	6	0	4	11	8	5	36	18	0	0	1
0241		52a(4). Pulse Modulation														
		H4-62 Do you use "PM" demodulation principles	2	41	12	28	1	5	13	23	10	25	47	15	4	9
		H4-63 Do you trace block diagrams of PM receivers	2	42	10	24	0	8	18	25	11	27	44	24	5	16
		H4-64 Do you trace block diagrams of PM receiver subassemblies or circuit cards	2	41	8	23	0	6	17	23	11	27	41	4	2	2
		H4-65 Do you trace schematic diagrams of PM receiver subassemblies or circuit cards	2	38	8	23	0	5	16	19	10	26	41	2	2	1
		H4-69 Do you align or adjust PM receivers or circuits	2	37	9	25	0	5	15	19	11	25	38	0	2	2
0242		52b. Isolate faulty receivers														
		H4-14 Do you troubleshoot AM receivers to major units	19	38	7	29	0	6	30	46	4	44	32	2	1	16
		H4-15 Do you troubleshoot AM receivers to subassemblies or circuit cards	19	34	6	29	0	6	30	45	4	45	35	0	0	3
		H4-29 Do you troubleshoot SSB receivers to major units	5	7	2	6	0	4	13	8	4	35	18	0	0	5

D	T Task	Task Title	304	309	316	324	404	451	451	451	451	451	451	451	452	452	452	452	452	51A	51B	51C
Y	Nbr		55	50	53	50	50	54A	54B	55	56A	56B										
H	590	H4-30 Do you troubleshoot SSB receivers to sub-assemblies or circuit cards	5	6	2	6	0	4	12	8	4	38	18	0	0	1						
H	607	H4-47 Do you troubleshoot FM receivers to major units	26	47	18	29	0	14	28	46	8	30	41	12	2	25						
H	608	H4-48 Do you troubleshoot FM receivers to subassemblies or circuit cards	25	42	13	29	0	14	24	48	10	31	44	2	0	3						
H	626	H4-66 Do you troubleshoot PM receivers to major units	2	39	8	23	0	5	16	22	11	26	41	14	5	10						
H	627	H4-67 Do you troubleshoot PM receivers to subassemblies or circuit cards	2	35	7	23	0	6	15	22	11	26	41	0	2	0						

0243 52c. Troubleshoot circuits

H	576	H4-16 Do you troubleshoot AM receiver subassemblies or circuit cards to circuit level components	18	30	4	29	0	4	9	10	2	36	24	0	1	3						
H	591	H4-31 Do you troubleshoot SSB receiver subassemblies or circuit cards to circuit level components	5	6	1	6	0	4	5	3	4	34	9	0	0	1						
H	609	H4-49 Do you troubleshoot FM receiver subassemblies or circuit cards to circuit level components	24	38	10	29	0	7	7	13	5	25	26	1	0	1						
H	628	H4-68 Do you troubleshoot PM receiver subassemblies or circuit cards to circuit level components	2	31	5	22	0	3	6	7	7	22	24	0	2	0						

0244 53. Transmission Power

0245 53a. Perform measurements

I	660	I1-1 Do you measure RF power	22	58	27	79	1	73	90	76	43	95	65	42	7	51						
I	661	I1-2 Do you measure RF peak power	17	39	19	75	1	67	80	59	36	86	59	18	2	28						
I	662	I1-3 Do you measure RF average power	17	38	16	69	1	55	77	48	28	73	56	15	0	14						
I	663	I1-4 Do you measure RF effective power	14	30	13	60	1	43	41	38	18	45	53	18	0	16						
I	664	I1-5 Do you measure RF output power using wattmeters	20	37	22	68	1	54	76	63	25	67	50	30	9	62						

0246 53b. Calculations

I	665	I2-1 Do you calculate RF apparent power	3	18	5	45	2	19	29	17	11	25	26	1	0	5						
I	666	I2-2 Do you calculate RF true power	3	20	8	55	2	22	29	19	13	30	32	1	0	8						
I	667	I2-3 Do you calculate RF power loss or gain in db	8	44	17	73	2	54	74	53	24	75	50	10	2	14						

D **Tsk** **Nbr**

Task Title

304 309 316 324 404 451 451 451 451 451 452 452 452
555 50 53 50 50 54A 54B 55 56A 56B X7 51A 51B 51C

0247 54. Antennas

0248 54a. Theory of operation

H 634	H5-5 Do you plot graph radiation patterns	1	5	3	1	0	1	4	5	4	4	21	4	0	3
H 637	H5-8 Do you work with Yagi antennas	12	2	3	0	0	0	2	1	1	0	3	2	0	1
H 638	H5-9 Do you work with dipole antennas	11	36	17	7	0	1	50	16	7	19	35	51	9	58
H 639	H5-10 Do you work with slotted antennas	1	0	3	2	0	1	21	15	1	3	9	18	1	1
H 640	H5-11 Do you work with rotary antennas	1	2	2	4	0	1	6	4	4	5	12	15	0	10
H 641	H5-12 Do you work with hertz antennas	0	2	1	1	0	0	2	1	2	2	0	2	0	10
H 642	H5-13 Do you work with marconi antennas	0	2	0	2	0	1	2	3	2	1	0	3	0	7
H 643	H5-14 Do you work with rhombic antennas	0	1	0	1	0	0	2	1	1	2	0	3	0	5
H 644	H5-15 Do you work with scimitar antennas	0	0	0	1	0	1	2	1	1	0	0	2	0	2
H 645	H5-16 Do you work with parabolic antennas	6	54	11	2	0	1	4	8	20	7	18	9	1	10
H 646	H5-17 Do you work with ground plane antennas	2	7	8	5	0	1	3	11	4	13	12	8	1	11
H 647	H5-18 Do you perform tasks on rotary antenna arrays	0	4	2	2	0	1	4	3	3	2	9	10	1	7
H 648	H5-19 Do you perform tasks on stacked (end fire) antenna arrays	1	1	0	0	0	0	3	1	1	1	9	2	0	1
H 649	H5-20 Do you perform tasks on broadside antenna arrays	0	0	0	1	0	0	2	1	1	1	3	4	0	1
H 650	H5-21 Do you perform tasks on cardioid antenna arrays	1	1	1	0	0	0	2	4	1	3	3	4	4	37
H 651	H5-22 Do you perform tasks on collinear antenna arrays	1	1	0	1	0	1	2	2	1	0	3	2	0	1
H 652	H5-23 Do you perform tasks on phase antenna arrays	2	19	4	2	0	0	13	20	7	7	53	17	1	12
H 653	H5-24 Do you perform tasks on planar antenna arrays	2	7	3	1	0	2	41	13	7	2	9	54	6	8
H 654	H5-25 Do you perform tasks on antennas with vertical polarization	7	14	13	3	1	2	19	16	14	8	38	36	5	13
H 655	H5-26 Do you perform tasks on antennas with horizontal polarization	7	17	10	3	1	3	20	15	14	5	38	35	5	9
H 656	H5-27 Do you perform tasks on antennas with circular polarization	2	34	14	3	1	1	18	11	14	5	47	21	2	12
H 657	H5-28 Do you perform tasks on antennas with unidirectional radiation patterns	9	36	14	5	1	1	16	24	9	11	50	38	6	37
H 658	H5-29 Do you perform tasks on antennas with bidirectional radiation patterns	6	13	7	4	1	1	15	14	13	9	47	17	5	17
H 659	H5-30 Do you perform tasks on antennas with omnidirectional radiation patterns	11	22	15	6	1	4	30	23	10	18	41	29	9	64

0249 54b. Perform alignments

	H 630	H5-1	Do you physically align antennas	15	46	21	5	0	8	46	27	27	12	44	34	4	20
H 631	H 631	H5-2	Do you electrically align antennas	10	48	10	6	0	6	46	35	35	12	50	18	1	8
H 636	H 636	H5-7	Do you measure standing wave ratio (SWR) for antennas	8	21	12	10	0	1	20	29	7	17	35	13	1	39

D	Tsk	Nbr
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Task Title

304	309	316	324	404	451	451	451	451	451	452	452	452
555	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B 51C

0250 54c. Isolate faulty antennas

H 632	H5-3	Do you troubleshoot loading of antennas
H 633	H5-4	Do you troubleshoot coupling of antennas
H 635	H5-6	Do you troubleshoot antenna components

7	21	10	5	0	6	15	20	10	14	35	10	5	21
6	25	10	5	0	3	20	20	13	14	47	14	6	17
7	52	13	4	0	5	42	40	26	10	50	40	12	35

0251 55. Microphones

0252 55a. Theory of operation

J 668	JL-1	Do you trace block diagrams of circuits containing microphones
J 669	JL-2	Do you trace schematic diagrams of microphones
J 672	JL-5	Do you work on carbon microphones
J 673	JL-6	Do you work on capacitor microphones
J 674	JL-7	Do you work on crystal microphones
J 675	JL-8	Do you work on dynamic microphones
J 676	JL-9	Do you work on velocity ribbon microphones

57	6	11	7	25	1	4	18	2	17	3	9	6	43
56	6	8	7	25	1	3	16	2	16	3	6	6	18
45	3	6	3	16	1	1	18	1	16	3	2	1	20
32	0	3	4	10	1	1	2	0	2	3	0	0	2
28	3	5	6	11	1	1	5	0	3	0	0	1	7
56	4	10	6	13	1	2	10	1	11	6	2	1	7
13	0	0	1	3	1	0	1	0	1	0	0	0	0

0253 55b. Isolate faulty microphones

670 J1-3 Do you troubleshoot to isolate a faulty microphone

61	7	12	7	27	1	5	19	2	18	6	6	7	35
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254 55c. Troubleshoot circuits

671 J1-4 Do you troubleshoot microphones

58 3 7 7 23 1 1 13 1 13 3 0 1 11

255 56. Speakers

256 50a. Theory of operation

677 J1-10 Do you trace block diagrams of circuits containing speakers

62 19 10 14 33 3 7 16 1 14 6 4 4 27

D	T	Task																		
Y	Nbr	Title																		
J 678	JL-11	Do you trace schematic diagrams of speaker circuits	304	309	316	324	404	451	451	451	451	451	451	451	451	451	452	452	452	452
			55	50	53	50	50	54A	54B	55	56A	56B	X7	51A	51B	51C				
			60	16	8	13	34	3	5	13	1	13	3	3	3	4	14			
0257	56b.	Isolate faulty speakers																		
J 679	JL-12	Do you troubleshoot to isolate a faulty speaker	63	17	11	12	36	3	6	17	1	13	3	2	2	2	1			
0258	56c.	Troubleshoot circuits																		
J 680	JL-13	Do you troubleshoot speakers	50	7	8	8	26	3	3	9	0	8	3	0	0	7				
0259	57.	Photosensitive Devices																		
0260	57a.	Theory of operation																		
J 681	J2-1	Do you trace block diagrams of circuits containing photosensitive devices	46	55	14	32	43	29	23	23	5	25	21	10	2	13				
J 682	J2-2	Do you trace schematic diagrams of photosensitive device circuits	46	52	13	32	44	26	22	18	4	23	9	3	1	1				
J 684	J2-4	Do you adjust or calibrate photosensitive devices	35	42	11	29	35	15	10	16	3	16	6	0	0	0				
J 685	J2-5	Do you work on photodiodes	30	42	11	24	32	13	13	10	4	23	3	2	0	1				
J 686	J2-6	Do you work on phototransistors	31	13	8	21	22	8	11	4	3	8	6	2	0	0				
J 687	J2-7	Do you work on phototubes	12	2	2	19	25	6	2	6	1	1	0	1	0	1				
J 688	J2-8	Do you work on photo-SCRs	9	4	1	16	15	8	5	1	1	3	0	0	0	0				
J 689	J2-9	Do you work on photocells (Photoconductive or Photovoltaic)	17	30	10	24	38	13	8	8	3	7	6	2	0	2				
0261	57b.	Isolate faulty photosensitive devices																		
J 683	J2-3	Do you troubleshoot to isolate a faulty photo-sensitive device	46	52	14	30	44	23	23	19	4	23	9	4	1	4				
0262	58.	Display Tubes																		

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
B	181	B3-10 Do you use pseudo-random signal generators	2	30	11	18	0	6	7	5	4	3	35	2	0	1
B	182	B3-11 Do you use time mark signal generators	10	21	8	89	2	11	16	8	5	16	32	1	0	1
B	183	B3-12 Do you use multi-function (square/sine/triangular) signal generators	30	66	55	92	4	57	71	30	51	53	56	2	0	0
B	184	B3-13 Do you use TV signal generators	81	3	7	20	0	9	4	13	2	5	15	1	0	0
D	284	D1-10 Do you perform tasks on voltage multipliers (doublers/triplers)	65	38	20	77	18	33	32	26	34	44	35	8	1	4
D	285	D1-11 Do you perform tasks on DC to DC converters	55	41	32	73	20	47	48	26	45	51	32	10	6	5
D	286	D1-12 Do you perform tasks on inverters (DC to AC converters)	37	32	22	73	25	46	47	33	56	47	47	8	6	7
D	287	D1-13 Do you perform tasks on switching power supplies	47	44	25	62	27	26	18	14	22	23	15	7	5	8
J	697	J4-1 Do you trace block diagrams of TV systems or subassemblies	78	6	9	1	8	3	0	17	0	3	0	2	1	0
J	698	J4-2 Do you trace schematic diagrams of TV systems or component circuits	77	6	4	1	7	2	0	17	0	3	0	2	1	0
J	699	J4-3 Do you troubleshoot TV systems to major subassemblies	78	5	6	1	8	2	0	20	0	3	0	3	1	0
J	700	J4-4 Do you troubleshoot TV systems to circuit level components	78	3	3	1	4	4	2	10	0	3	0	0	0	0
J	701	J4-5 Do you adjust or calibrate TV systems or components	79	4	6	1	6	4	2	19	0	3	0	1	0	0
J	702	J4-6 Do you trace block diagrams of laser systems or subassemblies	7	19	5	2	4	2	2	1	0	0	0	2	2	0
J	703	J4-7 Do you trace schematic diagrams of laser systems or component circuits	7	19	5	2	4	2	2	1	0	0	0	2	1	0
J	704	J4-8 Do you troubleshoot laser systems to major subassemblies	6	19	5	2	4	2	2	1	0	0	0	2	1	0
J	705	J4-9 Do you troubleshoot laser systems to circuit level components	6	18	5	2	4	2	2	1	0	0	0	0	0	0
J	706	J4-10 Do you adjust or calibrate laser systems or components	6	19	5	2	4	2	2	1	0	0	0	0	0	0
J	707	J4-11 Do you trace block diagrams of infrared systems or subassemblies	5	2	4	1	2	2	2	1	1	7	0	1	0	1
J	708	J4-12 Do you trace schematic diagrams of infrared systems or component circuits	5	2	5	1	2	3	2	1	1	8	0	1	0	0
J	709	J4-13 Do you troubleshoot infrared systems to major subassemblies	5	2	5	1	2	3	2	1	1	8	0	1	0	0
J	710	J4-14 Do you troubleshoot infrared systems circuit level components	5	2	5	0	2	2	2	1	1	8	0	0	0	0
J	711	J4-15 Do you inspect, clean, or service infrared systems: or components	6	2	5	0	3	3	2	1	1	8	0	1	0	1
J	712	J4-16 Do you adjust or calibrate infrared systems or components	4	2	5	1	2	2	2	1	1	8	0	1	0	0

Report Option Table for Modules

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Report Option Table for Tasks

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Description of Reported Module Factors

Col	Factor	Source vector	Title	Module Statement	Number Members	Mean	S.D.	Max	Min	Valid
1	TITLE									

Description of Reported Task Factors

Col	Factor	Source vector	Title	Task Statement	Number Members	Mean	S.D.	Max	Min	Valid
1	TITLE									
2	F0065	GP0068/PHP		All DAFSC 45252A	85	9.47	15.40	92.94	.00	712
3	F0066	GP0069/PHP		All DAFSC 45252B	105	9.93	17.32	100.00	.00	712
4	F0067	GP0070/PHP		All DAFSC 45252C	98	9.40	15.91	97.96	.00	712
5	F0068	GP0071/PHP		All DAFSC 45253A	97	13.32	18.18	98.97	.00	712
6	F0069	GP0072/PHP		All DAFSC 45253B	61	10.57	18.77	100.00	.00	712
7	F0070	GP0073/PHP		All DAFSC 45253C	68	11.83	18.71	100.00	.00	712
8	F0071	GP0074/PHP		All DAFSC 45271	227	11.70	16.59	95.15	.00	712
9	F0072	GP0075/PHP		All DAFSC 45272	271	11.35	15.98	94.46	.00	712
10	F0073	GP0076/PHP		All DAFSC 45273	147	13.57	17.56	98.64	.00	712
11	F0074	GP0077/PHP		All DAFSC 45550A	149	22.92	22.87	97.32	.00	712
12	F0075	GP0078/PHP		All DAFSC 45550B	146	16.07	19.03	98.63	.00	712

Col	Factor	Source vector	Title	Number Members	----- Based on All Tasks Within Range -----			
					Mean	S.D.	Max	Min Valid
13	F0094	GP0117/PMP	All DAFSC 455X3A	108	20.25	20.98	98.15	.00 712
14	F0099	GP0139/PMP	All DAFSC 456X0	111	21.07	23.35	97.30	.00 712

PRTMOD

Lourey TTC AFSCs matched to EF/A STS (2 of 3)

PM0037

Occupational Analysis Program
USAFOMC (ATC) Randolph AFB TX

Page 3

Electronic Principles Inventory (EPI) data for Air Force specialties is presented below in Electronic Fundamentals/Applications order. Data for this report was collected from job incumbents during the period March 1987 - April 1989

Percent members responding "YES" is shown for each specialty listed. Where skill level is not specified, both 5 and 7 skill levels are included (e.g., DAFSC 000X0 includes 00050 and 00070).

For assistance in using this EPI printout phone USAFOMC/OMYA, at AUTOVON 487-6623.

D

T Task
Y Nbr

Task Title

452 452 452 452 452 452 452 452 452 452 455 455 455 456
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

0001 SFS 1 Electronic Fundamentals/
Applications dated 20 Feb 1987

0002 1. Basic Terms

0003 1a. Metric Notation

B

A 1 A1-1 Do you use metric terms (example mili, kilo, mega)

54 67 52 75 85 71 67 60 79 72 58 76 88

0004 1b. DC Terms

B

A 2 A1-2 Do you use basic DC electrical/electronic terms

88 97 95 97 97 93 93 94 97 94 97 96 97

0005 1c. AC Terms

B

A 3 A1-3 Do you use basic AC electrical/electronic terms

88 97 94 96 97 91 93 94 97 93 97 95 97

0006 2. Basic Circuits

D	T	Y	Tsk	Nbr
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Task Title

[illegible]

0007 2a. Theory of operation

8

A 4 Al-4 Do you trace schematic or block diagrams of circuits containing conductors, fuses, lamps, switches, or batteries

86 100 96 96 97 91 92 93 99 97 95 96 97

0008 2b. Troubleshoot circuits

2b

A 5 A1-5 Do you troubleshoot circuits containing conductors, fuses, lamps, switches, or batteries

84	95	93	87	97	84	86	89	95	95	92	94	95
----	----	----	----	----	----	----	----	----	----	----	----	----

0009 3. Basic Circuit Calculations

0010 3a. DC

22

A 6 Al-6 Do you calculate values of DC voltage, current, resistance, or power

31 25 19 44 46 25 21 26 27 50 28 43 59

A 12 Al-12 Do you calculate the value of a resistor required for a circuit

13 15 14 14 18 7 13 17 16 32 28 31 26

0011 3b. AC

82

A 7 Al-7 Do you calculate values of AC effective voltage, average voltage, or peak-to-peak voltage

14	17	17	39	38	18	16	19	22	49	27	44	55
----	----	----	----	----	----	----	----	----	----	----	----	----

A 8 A1-8 Do you calculate values of frequency, phase average voltage, or peak-to-peak voltage relationship, or wave length

14 17 15 40 33 22 16 18 20 55 27 46 58

0012 4. Resistors

0013 4a. Theory of operation

8

A 9 Al-9 Do you trace schematic or block diagrams of circuits containing resistors

52 53 63 67 75 40 48 63 65 89 78 84 85

D	T Tsk	Task Title	452	452	452	452	452	452	452	455	455	455	456
Y Nbr			52A	52B	52C	53A	53B	53C	71	72	73	50A	50B X3A X0
A 11	Al-11	Do you calibrate or adjust circuits by using variable resistors	21	25	18	32	49	18	21	26	38	81	63 71 71
0014	4b.	Isolate faulty resistors	2b										
A 10	Al-10	Do you troubleshoot circuits to isolate a faulty resistor	27	30	46	29	41	13	23	39	31	73	63 55 59
A 14	Al-14	Do you ohm check resistors	36	31	43	28	41	22	27	44	39	79	71 69 78
0015	4c.	Color code	B										
A 13	Al-13	Do you determine ohmic value of a resistor using the color code	12	20	17	15	16	10	15	21	21	60	58 54 50
0016	5.	Relays/Solenoids											
0017	5a.	Relay theory of operation	B										
A 15	Al-15	Do you trace schematic or block diagrams of circuits containing relays	93	99	92	85	97	75	89	91	92	95	86 98 94
A 17	Al-17	Do you adjust relays	18	20	18	18	15	20	18	20	20	26	17 21
A 18	Al-18	Do you perform tasks on contacts, cores, coils, armatures, or springs	19	30	21	21	21	18	23	21	24	28	34 26 23
0018	5b.	Isolate faulty relays	2b										
A 16	Al-16	Do you troubleshoot circuits to isolate a faulty relay	89	97	87	73	90	69	84	90	85	87	85 96 92
A 19	Al-19	Do you continuity check relays	76	89	65	62	80	65	77	76	80	83	77 89 81
0019	5c.	Solenoid theory of operation											
A 77	A2-33	Do you trace schematic or block diagrams of circuits containing solenoids	21	32	8	24	59	13	28	21	46	64	54 17 23
A 79	A2-35	Do you perform maintenance on solenoid component parts	2	10	2	5	10	0	7	5	11	30	31 6 6

D Tsk
 Y Nbr Task Title 452 452 452 452 452 452 452 452 452 452 455 455 455 456
 52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

0020 5d. Isolate faulty solenoids

A 78 A2-34 Do you troubleshoot circuits to isolate a faulty solenoid 13 30 6 15 44 6 22 17 39 62 54 14 23

0021 6. Inductors

0022 6a. Theory of operation B

A 20 A1-20 Do you trace schematic or block diagrams of circuits containing inductors, chokes, or choke coils 31 21 22 42 16 19 26 32 27 56 54 47 48
 A 25 A1-25 Do you calibrate or adjust circuits by using variable inductors 6 6 2 8 7 1 4 6 12 25 29 22 20

0023 6b. Isolate faulty inductors 2b

A 21 A1-21 Do you troubleshoot circuits to isolate a faulty inductor, choke, or choke coil 13 12 9 12 8 3 13 19 15 45 45 30 26
 A 26 A1-26 Do you ohm check inductors 11 13 9 11 11 3 12 20 14 38 40 32 23

0024 6c. Calculations B

A 22 A1-22 Do you calculate values of circuit total inductance 4 4 3 5 5 0 5 7 8 10 17 10 6
 A 23 A1-23 Do you calculate values of circuit or component inductive reactance 4 4 2 2 7 1 5 7 9 16 6 6
 A 24 A1-24 Do you calculate values of circuit voltage or current in circuits containing inductors 4 4 3 5 7 1 6 6 6 15 17 12 8

0025 7. Capacitors

D	T	Tsk	Nbr
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Task Title

452 452 452 452 452 452 452 452 452 452 452 452 452 456
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

0032	8b. Isolate faulty transformers	2b
------	---------------------------------	----

A 36	Al-36 Do you troubleshoot circuits to isolate a faulty transformer	49	42	43	30	52	12	23	60	48	68	52	71	71
A 40	Al-40 Do you ohm check transformers	35	30	33	16	39	10	16	46	39	54	49	48	43
A 41	Al-41 Do you measure transformer output voltage	34	31	33	24	51	19	19	44	44	64	52	57	66

0033 8c. Calculations

A	37	Al-37 Do you calculate transformer voltage or current step-up or step-down ratios	16	11	13	7	16	6	5	15	18	17	21	21	15
A	38	Al-38 Do you calculate impedance of transformers	13	9	9	4	7	3	4	13	14	13	16	14	9

0034 9. Three Phase Transformers

00035	9a. Theory of operation	B

A 42	Al-42 Do you trace schematic or block diagrams of circuits containing three phase transformers	32	28	15	27	39	18	15	33	34	52	38	56	53
A 44	Al-44 Do you adjust three phase transformers	11	12	6	5	8	3	5	11	14	17	20	15	28

00036 9b. Isolate faulty three phase trans-
formers

A 43 Al-4: Do you troubleshoot circuits to isolate a faulty three phase transformer

0037 10. DC Motors

00038	10a. Theory of operation	B

A 45 A2-1 Do you trace schematic or block diagrams of
circuits containing DC motors

D
T Task
Y Nbr Task Title 452 452 452 452 452 452 452 452 452 452 455 455 455 456
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

0046 12a. Theory of operation -----

A 53 A2-9 Do you trace schematic or block diagrams of circuits 15 38 14 16 31 9 15 21 20 15 17 16 20
containing DC generators
A 56 A2-12 Do you perform tasks on component parts of DC 5 12 3 0 8 0 3 6 7 4 9 4 9
generators

0047 12b. Isolate faulty DC generators -----

A 54 A2-10 Do you troubleshoot to isolate a faulty DC generator 6 31 7 6 25 1 9 16 13 13 15 12 19

0048 12c. Troubleshoot DC generators -----

A 55 A2-11 Do you troubleshoot DC generator component parts 5 14 4 0 15 0 4 7 7 4 10 5 7

0049 13. AC Generators ----------
0050 13a. Theory of operation -----

A 57 A2-13 Do you trace schematic or block diagrams of circuits 12 36 12 14 28 9 15 25 24 13 14 18 14
containing AC generators
A 60 A2-16 Do you perform tasks on component parts of AC 5 11 3 0 8 0 2 7 7 3 7 3 5
generators

0051 13b. Isolate faulty AC generators -----

A 58 A2-14 Do you troubleshoot circuits to isolate a faulty 6 32 9 5 23 1 7 21 16 11 13 12 13
AC generator

0052 13c. Troubleshoot AC generators -----

A 59 A2-15 Do you troubleshoot AC generator component parts 5 13 5 0 15 0 3 8 7 4 7 3 4

D	T	Tsk	Nbr
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Task Title

452 452 452 452 452 452 452 452 452 452 452 452 452
 452A 452B 452C 453A 453B 453C 71 72 73 50A 50B X3A X0

0067 18. Meter Movements

0068 18a. Theory of operation B

A 80	A2-36 Do you trace schematic or block diagrams of circuits containing meter movements	16	26	9	46	33	15	26	22	39	26	17	52	56
A 82	A2-38 Do you perform maintenance on meter movement mechanical parts	4	10	3	13	10	1	7	6	12	13	9	19	16

0069 18b. Isolate faulty meter movements 2b

A	81	A2-37	Do you troubleshoot circuits to isolate a faulty meter movement	11	21	7	31	30	13	22	18	30	23	17	50	50
---	----	-------	---	----	----	---	----	----	----	----	----	----	----	----	----	----

0070 19. Solid State Diodes

0071 19a. Theory of operation B

A 83 A3-1 Do you trace schematic or block diagrams of circuits containing diodes

0072 19b. Isolate faulty solid state diodes 2b

A 84	A3-2	Do you troubleshoot circuits to isolate a faulty diode	25	45	45	37	44	22	46	48	77	67	69	71	
A 85	A3-3	Do you check diodes using an ohmmeter	21	41	38	33	46	26	44	42	48	73	71	73	69

0073 19c. Specifications B

A	86	A3-4.	Do you use diode characteristic curves	6	8	5	2	8	6	7	6	11	10	14	6	8
A	87	A3-5.	Do you use diode substitution information	7	10	8	0	5	3	8	6	13	19	22	14	19

D	Tsk	Nbr
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Task Title

452 452 452 452 452 452 452 452 452 452 452 452 452 452 452

52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

0074 19d. Color code

88

A 88 A3-6 Do you use diode color codes

8 10 7 1 3 9 7 7 13 16 24 15 17

0075 20. Bipolar Junction Transistors

0076 20a. Theory of operation

8

A 89 A3-7 Do you trace schematic or block diagrams of circuits containing transistors

35 28 33 47 64 34 37 39 54 85 70 74 59

0077 20b. Isolate faulty transistors

92

A 90 A3-8 Do you troubleshoot circuits to isolate a faulty transistor

12 14 18 11 26 9 14 16 29 77 61 49 42

A 91 A3-9 Do you check transistors using an ohmmeter

	11	12	17	7	25	9	11	11	24	72	58	50	34
1	11	12	17	7	25	9	11	11	24	72	58	50	34

A 92 A3-10 Do you check transistors using transistor testers

7	9	9	0	8	9	6	5	14	20	32	6	5
---	---	---	---	---	---	---	---	----	----	----	---	---

00078 20c. Specifications

A 93 A3-11 Do you use transistor characteristic curves

6 5 4 1 3 7 3 4 10 6 12 5 4

A 94 Do you use transistor substitution information

8	6	5	1	2	7	4	3	10	21	18	11	11
---	---	---	---	---	---	---	---	----	----	----	----	----

0079 21. Integrated Circuits

0080 21a. Familiarization

22

A 95 A3-13 Do you trace schematic or block diagrams of circuits containing integrated circuits (IC)

40 38 30 39 51 29 44 42 37 83 54 69 60

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Task Title
452 452 452 452 452 452 452 452 452 455 455 455 456
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

0081 2lb. Isolate faulty integrated circuits 2b

A 96 A3-14 Do you troubleshoot circuits to isolate a faulty IC 15 23 10 10 23 6 14 15 16 63 47 26 38

0082 2lc. Specifications B

A 97 A3-15 Do you use IC substitution information 5 10 6 5 7 4 9 7 6 19 1 9 22

0083 2d. Solid State Special Purpose Devices
(SCR, Zener Diode, Tunnel Diode, LED,
LCD, UJT, JFET, MOSFET)

0084 2da. Theory of operation B

A 98 A3-16 Do you trace schematic or block diagrams of circuits
containing solid-state special purpose devices 19 15 9 20 18 13 23 19 19 50 37 37
A 100 A3-18 Do you perform tasks on varactors/varicaps 7 5 2 3 2 4 4 6 5 10 7 7 3
A 101 A3-19 Do you perform tasks on tunnel diodes 6 4 1 2 0 1 4 3 3 8 7 5 3
A 102 A3-20 Do you perform tasks on field effect transistors (FET) 7 6 1 2 0 1 7 6 6 41 24 33 17
A 103 A3-21 Do you perform tasks on unijunction transistors (UJT) 8 7 3 3 3 1 5 6 4 33 29 23 13
A 104 A3-22 Do you perform tasks on zener diodes 9 19 5 7 18 4 8 13 12 52 38 45 29
A 105 A3-23 Do you perform tasks on liquid crystal displays (LCD) 9 9 3 6 0 4 8 8 7 29 21 13 16
A 106 A3-24 Do you perform tasks on pin diodes 9 4 3 2 2 3 6 5 5 12 8 8 7
A 107 A3-25 Do you perform tasks on light emitting diodes (LED) 14 12 5 15 7 1 13 14 12 58 34 21 39
A 108 A3-26 Do you perform tasks on fantail transistors 8 4 2 1 6 4 3 3 7 4 5 3
A 109 A3-27 Do you perform tasks on silicon controlled rectifiers
(SCR) 6 7 1 4 3 0 4 5 7 29 1 37 15
A 110 A3-28 Do you perform tasks on triacs 7 5 2 2 0 1 4 4 4 9 5 7
A 111 A3-29 Do you perform tasks on programmable unijunction
transistors (PUT) 8 4 2 1 0 0 4 4 3 4 5 3
A 112 A3-30 Do you perform tasks on silicon controlled
switches (SCS) 6 4 2 1 2 1 4 4 3 13 7 3 5
A 113 A3-31 Do you perform tasks on silicon unilateral
switches (SUS) 7 4 2 1 0 1 4 3 3 3 5 1 2
A 114 A3-32 Do you perform tasks on step recovery diodes (SRD) 5 5 2 1 0 1 4 3 3 4 3 3 3
A 115 A3-33 Do you perform tasks on field effect diodes (FED) 6 7 2 1 0 0 5 4 4 10 15 13 11
A 116 A3-34 Do you perform tasks on DIAC (Bi-directional
trigger diode) 6 5 2 1 0 0 4 4 3 3 3 2 2
A 117 A3-35 Do you perform tasks on varistors 8 6 2 6 11 1 5 5 6 19 10 15 4
A 118 A3-36 Do you perform tasks on metal oxide varistors (MOV) 7 4 1 1 2 3 4 3 4 4 3 2 1

PRTHOD Lowry TTC AFSCs matched to EF/A STS (2 of 3) PM0037

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Task Title

A 119 A3-37 Do you perform tasks on schottky diodes 7 7 2 1 0 1 4 4 3 14 6 8 9

0085 22b. Isolate faulty special purpose devices 2b

A 99 A3-17 Do you troubleshoot circuits to isolate a faulty solid-state special purpose device 11 9 2 3 7 4 10 10 9 43 34 28 25

0086 23. Electron Tubes

0087 23a. Theory of operation B

A 120 A4-1 Do you trace block diagrams of circuits containing electron tubes 11 1 2 13 0 9 7 7 10 23 12 44 40
A 121 A4-2 Do you trace schematic diagrams of electron tube circuits 6 1 1 5 0 4 3 3 7 21 10 39 33
A 125 A4-6 Do you perform tasks on diode tubes 1 2 0 2 0 0 0 2 2 3 2 10 11
A 126 A4-7 Do you perform tasks on triode tubes 0 1 0 1 0 0 0 2 2 1 1 10 5
A 127 A4-8 Do you perform tasks on tetrode tubes 0 1 1 0 0 0 0 1 1 1 1 6 4
A 128 A4-9 Do you perform tasks on pentode tubes 0 1 1 0 0 0 0 1 2 1 1 4 3
A 129 A4-10 Do you perform tasks on beam power tubes 1 1 0 0 0 0 1 1 3 6 3 11 3
A 130 A4-11 Do you perform tasks on gas tubes 4 1 1 2 0 3 0 1 2 3 2 4 4
A 131 A4-12 Do you perform tasks on phantastons 1 1 1 0 0 0 0 1 1 0 2 2 0
A 132 A4-13 Do you perform tasks on neon tubes 0 1 1 1 0 3 0 1 2 1 1 2 1
A 133 A4-14 Do you perform tasks on xenon tubes 0 1 1 0 2 0 1 0 1 2 6 0 1
A 134 A4-15 Do you perform tasks on nixie tubes 1 3 1 6 0 3 4 2 4 3 0 3 2

0088 23b. Isolate faulty tubes

A 122 A4-3 Do you troubleshoot circuits to isolate a faulty electron tube 2 1 1 4 0 4 2 3 5 20 10 37 32

0089 23c. Specifications

A 123 A4-4 Do you use electron tube characteristic curves 2 2 0 0 0 3 0 1 1 3 1 4 4
A 124 A4-5 Do you use electron tube substitution manuals or charts 2 2 0 1 0 3 0 1 2 3 1 6 6

D	Tsk	Y Nbr
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Task Title

452 452 452 452 452 452 452 452 452 452 452 452 452 452 452 452
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

0096 25c. Multipin connectors

2b

A 149	A5-9 Do you repair or fabricate connectors or cables on multiconductor cables
A 152	A5-12 Do you repair or fabricate connectors or cables on ribbon cables

54	57	51	62	48	60	67	59	68	68	58	59	62
20	20	14	12	10	12	13	20	16	23	15	4	22

0097 25d. Coaxial connectors

A 150	A5-10 Do you repair or fabricate connectors or cables on coaxial cables
A 151	A5-11 Do you repair or fabricate connectors or cables on triaxial cables

71	45	38	96	89	96	88	76	93	86	65	87	95
44	19	38	31	20	60	78	41	52	62	27	15	68

0098 26. Assemble Solderless Connectors

0099 26a. Crimp

2b

A 146 A5-6 Do you use crimping tool to repair or make connections
A 147 A5-7 Do you use wire wrap tool to make connections
A 148 A5-8 Do you use punch-on tool to make connections

Year	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1981	81	94	90	98	97	100	95	90	95	94	93	94	95		
1982	28	34	39	25	33	21	30	25	31	30	29	22	29		
1983	19	29	29	20	20	15	21	23	24	18	18	8	16		

0100 26b. Coaxial

2b

A 150	A5-10 Do you repair or fabricate connectors or cables on coaxial cables
A 151	A5-11 Do you repair or fabricate connectors or cables on triaxial cables

71	45	88	96	89	96	88	76	93	86	65	87	35
44	19	38	31	20	60	78	41	52	62	27	15	68

0101 26c. Multipin

2b

A 149	A5-9 Do you repair or fabricate connectors or cables on multiconductor cables
A 152	A5-12 Do you repair or fabricate connectors or cables on ribbon cables

54 57 51 62 48 60 67 59 68 68 58 59 62
20 20 14 12 10 12 13 20 16 23 15 4 22

.. Tsk
 Y Nbr Task Title
 452 452 452 452 452 452 452 452 452 452 455 455 455 456
 52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

0102 27 Use Test Equipment Usage

0103 27a. Multimeter, analog 2b

B 153 B1-1 Do you use the multimeter to measure DC voltage values 88 97 88 99 100 99 92 89 96 97 99 93 97
 B 154 B1-2 Do you use the multimeter to measure AC voltage values 87 94 87 97 98 99 92 87 96 95 92 96
 B 155 B1-3 Do you use the multimeter to extend the range of
 voltmeters using external shunts 15 21 12 16 16 18 18 16 14 28 32 26 29
 B 156 B1-4 Do you use the multimeter to measure DC current values 64 61 48 70 61 68 50 48 53 71 68 59 69
 B 157 B1-5 Do you use the multimeter to measure AC current values 61 59 49 70 61 66 48 47 51 68 62 58 68
 B 158 B1-6 Do you use the multimeter to extend the range of
 ammeters using external shunts 15 15 10 12 15 21 15 13 16 23 24 13 19
 B 159 B1-7 Do you use the multimeter to measure circuit resistance 86 90 78 70 93 76 78 85 86 85 77 84 79
 B 160 B1-8 Do you use the multimeter to measure component
 resistance 66 79 52 53 80 56 65 63 65 80 71 80 78

0104 27b. Oscilloscope 2b

B 161 B2-1 Do you use the oscilloscope to measure time to
 determine frequency 6 2 3 46 20 23 3 5 22 82 54 62 75
 B 162 B2-2 Do you use the oscilloscope to measure time (rise,
 fall, pulse width, etc) 6 2 4 43 16 25 4 5 25 83 55 61 90
 B 163 B2-3 Do you use the oscilloscope to measure AC voltage 7 3 5 46 34 37 5 7 33 83 56 61 87
 B 164 B2-4 Do you use the oscilloscope to measure DC voltage 7 3 5 45 33 35 5 8 35 84 60 56 88
 B 165 B2-5 Do you use the oscilloscope to measure ripple voltages 2 1 1 13 5 12 3 4 14 57 24 57 66
 B 166 B2-6 Do you use the oscilloscope to measure phase jitters 4 1 1 16 7 13 2 2 14 38 19 26 43
 B 167 B2-7 Do you use the oscilloscope to observe signal/data
 patterns 8 2 1 23 11 19 4 6 22 59 46 43 75
 B 168 B2-8 Do you use the oscilloscope to observe lissajous
 patterns 4 2 0 6 3 3 0 2 9 13 20 6 48
 B 169 B2-9 Do you use the oscilloscope to observe phase
 relationships 4 2 3 30 13 19 3 7 21 79 47 68 82
 B 170 B2-10 Do you use attenuator probes with oscilloscopes 6 2 2 21 10 19 2 6 21 66 39 46 64
 B 171 B2-11 Do you use delay time multipliers with
 oscilloscopes 4 2 2 13 5 7 1 2 11 44 26 16 40

0105 27c. Signal Generator 2b

B 172 B3-1 Do you use signal generators (SG) to perform
 operational checks 5 4 11 12 10 19 7 7 5 67 40 31 59

D	Tsk	Task Title	452	452	452	452	452	452	452	455	455	455	456
Y	Nbr		52A	52B	52C	53A	53B	53C	71	72	73	50A	50B X3A X0
0113		27k. DC restorer											
B 192		B4-8 Do you use DC restorers (CRT rejuvenators)	6	5	4	4	5	6	7	6	9	6	2 13
0114		27l. Logic current tracer											
B 193		B4-9 Do you use logic current tracers	4	5	4	4	7	4	7	6	10	5	12 3 2
0115		27m. Tube tester											
B 194		B4-10 Do you use tube testers	5	6	3	4	5	4	7	6	8	5	6 2 11
0116		27n. Logic pulser											
B 195		B4-11 Do you use logic pulsers	5	5	4	4	5	4	7	6	10	4	14 3 5
0117		27o. Logic analyzer											
B 196		B4-12 Do you use logic analyzers	5	6	5	4	5	6	8	7	10	9	12 2 5
0118		27p. Signature analyzer											
B 197		B4-13 Do you use signature analyzers	5	5	4	5	7	6	8	6	8	4	5 2 4
0119		27q. Reflectometer											
B 198		B4-14 Do you use reflectometers	41	42	64	55	39	60	57	62	59	54	22 27 14
0120		28. Transistor Amplifier Circuits (Common Emitter, Common Collector, Common Base)											

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Task Title

[illegible]

0124 28a(3). Coupling circuits

C 225	C3-1 Do you trace block diagrams of circuits containing coupling circuits
C 226	C3-2 Do you trace schematic diagrams of coupling circuits
C 229	C3-5 Do you perform tasks on direct coupling circuits
C 230	C3-6 Do you perform tasks on capacitive-resistive coupling circuits
C 231	C3-7 Do you perform tasks on capacitive-inductive coupling circuits
C 232	C3-8 Do you perform tasks on transformer coupling circuits
C 233	C3-9 Do you perform tasks on optical coupling circuits

16	10	19	12	10	18	13	15	14	45	25	24	21
12	10	12	5	7	7	9	10	9	42	25	21	17
4	8	9	7	5	4	4	5	8	30	21	14	16
2	8	3	3	7	3	2	2	8	31	20	13	8
2	9	4	3	3	0	2	3	8	27	16	12	7
7	7	9	2	5	3	6	10	7	26	15	12	13
2	4	1	3	2	1	1	2	4	25	9	2	5

0125	28b. Isolate faulty amplifier circuits	2b

C 201	C1-3 Do you troubleshoot to isolate a faulty transistor amplifier
C 205	C1-7 Do you measure transistor amplifier voltage, current, or power gain
C 227	C3-3 Do you troubleshoot circuits to isolate a faulty coupling circuit

6	3	15	6	21	1	7	7	10	55	40	27	21
2	2	4	4	11	3	4	3	6	35	29	21	12
7	4	10	4	7	3	2	7	6	29	23	16	14

0126 28c. Troubleshoot circuits

2b

C 202	C1-4 Do you troubleshoot transistor amplifiers to circuit level components
C 203	C1-5 Do you troubleshoot transistor amplifier distortion
C 219	C2-2 Do you troubleshoot amplifier stabilization circuits to circuit level components
C 228	C3-4 Do you troubleshoot coupling circuits to circuit level components

5	2	7	3	5	1	4	3	5	36	32	19	7
2	2	3	2	3	1	4	1	3	15	20	6	5
4	2	1	0	7	0	4	0	5	28	24	9	5
4	3	2	3	3	1	2	3	5	21	19	7	8

0127 29. Electron Tube Amplifiers

D
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Task Title

452 452 452 452 452 452 452 452 455 455 455 456
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

0132 30a. Theory of operation B

C 249 C5-1 Do you trace block or schematic diagrams of circuits containing operational amplifiers (op amps)

C 251 C5-3 Do you calculate op amp gain

C 252 C5-4 Do you adjust op amp bias, offsets, or drift

C 253 C5-5 Do you use or apply operational amplifiers for general purpose (inverting or non-inverting)

C 254 C5-6 Do you use or apply operational amplifiers as differential/comparators

C 255 C5-7 Do you use or apply operational amplifiers for summing

C 256 C5-8 Do you use or apply operational amplifiers for unity gain amplifier (buffer)

C 257 C5-9 Do you use or apply operational amplifiers as active filters

C 258 C5-10 Do you use or apply operational amplifiers as oscillators

C 259 C5-11 Do you use or apply operational amplifiers as integrators

C 260 C5-12 Do you use or apply operational amplifiers for differentiators

C 261 C5-13 Do you use or apply operational amplifiers for power supplies (voltage regulators)

C 262 C5-14 Do you use or apply operational amplifiers as analog/digital (A/D) digital/analog (D/A) converters

C 263 C5-15 Do you use or apply operational amplifiers as multipliers

C 264 C5-16 Do you use or apply operational amplifiers as modulators/demodulators

12	6	9	15	30	16	16	13	18	58	32	47	35
1	2	1	0	3	1	1	1	4	16	7	6	5
1	2	1	2	2	1	2	1	4	30	14	14	11
5	1	5	5	13	4	6	3	10	44	23	19	17
5	3	3	3	10	1	5	3	8	42	22	17	16
4	3	4	7	18	1	6	3	12	37	18	19	19
2	2	2	5	8	3	4	2	6	31	18	11	12
5	1	1	3	5	0	2	3	5	26	18	10	7
7	3	2	9	5	6	4	4	10	32	24	30	19
6	2	3	5	5	3	2	2	8	28	12	24	10
5	1	3	3	3	1	3	3	5	27	18	13	9
6	6	4	11	16	6	6	6	13	44	29	39	23
11	10	11	18	15	18	12	13	14	37	23	47	30
7	5	3	11	15	1	4	5	10	37	26	29	17
7	4	5	11	15	6	4	4	10	30	15	21	15

0133 30b. Isolate faulty Op Amps

C 250 C5-2 Do you troubleshoot to isolate a faulty op amp circuit 5 2 5 3 18 7 4 5 9 50 29 23 23

0134 31. Magnetic Amplifiers

D Task Y Nbr	Task Title																												
		452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452
D 308	D3-10 Do you perform tasks on transistor series power supply voltage regulators with current limiting	52A	52B	52C	53A	53B	53C	71	72	73	50A	50B	X3A	X0															
D 309	D3-11 Do you perform tasks on crow bar power supply voltage regulators	2	7	1	3	3	0	2	4	6	19	10	11	9															
		2	5	1	2	3	0	3	3	3	9	4	3	28															

0150	34b. Isolate faulty voltage regulators 2b																												
D 301	D3-3 Do you troubleshoot circuits to isolate a faulty power supply voltage regulator	7	38	7	7	11	1	6	13	7	50	32	39	59															

0151	34c. Troubleshoot circuits 2b																												
D 302	D3-4 Do you troubleshoot power supply voltage regulators to circuit level components	5	14	1	4	5	0	3	4	4	32	27	14	13															

0152	35. Resistive/Capacitive/Inductive (RCL) Circuits																												

0153	35a. Basic operation B																												
E 310	E1-1 Do you trace schematic or block diagrams of circuits containing resistive capacitive inductive (RCL) circuits	14	14	8	20	18	10	11	14	15	32	29	22	10															

0154	35b. Resonant operation B																												
F 312	E1-3 Do you trace schematic or block diagrams of circuits containing resonant RCL circuits	11	12	4	9	13	7	7	8	10	28	24	17	9															

0155	35c. Troubleshoot circuits 2b																												
E 311	E1-2 Do you troubleshoot RCL circuits to circuit level components	2	6	2	2	5	1	4	5	4	17	23	8	5															
E 313	E1-4 Do you troubleshoot resonant RCL circuits to circuit level components	2	4	2	2	3	1	3	2	4	14	18	5	5															

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Task Title

452 452 452 452 452 452 452 452 455 455 455 456
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

0161 36d. Calculations

E 321 E2-5 Do you calculate capacitance or inductance values for 1 2 1 0 2 3 2 1 3 5 3 3 2
specific frequency sensitive filters

0162 37. Wave Generating Circuits

0163 37a. Theory of operation

0164 37a(1). Oscillators (LC, RC, Crystal) B

F 327 F1-1 Do you trace block diagrams of circuits containing oscillators 19 8 8 35 10 16 25 17 20 42 27 50 38

F 328 F1-2 Do you trace schematic diagrams of oscillator circuits 11 5 2 13 3 7 15 6 11 40 24 44 30

F 331 F1-5 Do you align r adjust oscillator circuits 1 2 1 11 2 1 2 1 6 23 16 33 20

F 332 F1-6 Do the oscillators you work with use LC tank circuits 4 3 3 7 5 4 6 5 5 21 17 21 10

F 333 F1-7 Do the oscillators you work with use RC networks 5 5 2 9 2 4 7 7 24 21 22 15

F 334 F1-8 Do the oscillators you work with use crystals 6 3 2 20 2 9 10 7 7 20 10 40 28

F 335 F1-9 Do the oscillators you work with use phase lock loops (PLL) 6 3 3 6 2 6 7 8 7 21 12 9 14

F 336 F1-10 Do you perform tasks on series Hartley oscillator circuits 1 1 1 3 2 3 1 3 3 7 6 7 2

F 337 F1-11 Do you perform tasks on shunt Hartley oscillator circuits 1 1 1 3 0 3 1 3 3 9 9 7 3

F 338 F1-12 Do you perform tasks on Colpitts oscillator circuits 1 1 0 4 2 3 2 3 2 10 3 6 2

F 339 F1-13 Do you perform tasks on Clapp oscillator circuits 1 1 1 3 0 3 1 2 2 5 3 0 2

F 340 F1-14 Do you perform tasks on voltage control oscillators (VCO/VTD) 1 3 1 7 2 1 6 5 4 14 11 20 23

F 341 F1-15 Do you perform tasks on crystal oscillator circuits 1 1 2 8 2 4 4 5 4 15 12 30 20

F 342 F1-16 Do you perform tasks on Wien bridge oscillator circuits 1 1 1 2 2 1 1 2 1 11 4 5 3

F 343 F1-17 Do you perform tasks on pulse generating oscillator circuits 1 4 1 6 2 4 2 4 3 22 15 25 7

F 344 F1-18 Do you perform tasks on blocked/blocking oscillator circuits 1 2 1 3 0 3 1 3 2 8 13 5 4

F 345 F1-19 Do you perform tasks on burst generators 1 1 1 3 2 4 2 2 1 6 4 0 5

F 346 F1-20 Do you perform tasks on MC phase shift oscillators 1 2 1 5 2 3 2 4 3 13 12 6 5

Task Title
452 452 452 452 452 452 452 452 452 452 455 455 455 456
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

0165 37a(2). Multivibrators (Astable, Bistable, B Monostable)

F 347 F2-1 Do you trace block diagrams of circuits containing multivibrators 16 10 9 25 20 15 17 14 18 44 34 44 26
F 348 F2-2 Do you trace schematic diagrams of multivibrators circuits 11 7 2 8 10 6 8 8 10 40 33 31 19
F 351 F2-5 Do you adjust or align multivibrator circuits 2 1 1 1 3 1 1 1 2 19 16 19 6
F 352 F2-6 Do the multivibrators you work with use LC tank circuits 5 5 3 3 5 6 5 6 4 29 18 20 6
F 353 F2-7 Do the multivibrators you work with use RC networks 6 6 5 8 3 6 4 7 4 30 26 23 9
F 354 F2-8 Do the multivibrators you work with use Crystals 6 2 4 6 3 6 4 5 3 18 10 31 15
F 355 F2-9 Do you perform tasks on astable (free running) multivibrators 5 5 3 8 8 1 4 6 5 32 23 22 12
F 356 F2-10 Do you perform tasks on monostable (one shot) multivibrators 4 5 3 10 8 1 3 6 7 36 25 24 21
F 357 F2-11 Do you perform tasks on bistable (flip flop) multivibrators 4 5 2 10 10 1 3 6 7 38 29 29 22
F 358 F2-12 Do you perform tasks on triggered astable multivibrators 4 4 2 6 3 0 2 5 4 26 14 19 12

0166 37a(3). Waveshaping Circuits (Schmitt Trigger, Sawtooth, RC Integ/Diff) B

F 359 F3-1 Do you trace block diagrams of circuits containing waveshaping circuits (WSC) 7 7 4 18 3 6 9 7 5 44 27 33 15
F 360 F3-2 Do you trace schematic diagrams of WSC 6 3 2 9 2 0 4 3 3 42 25 24 13
F 363 F3-5 Do you adjust or calibrate WSC 1 1 1 0 0 0 1 0 1 30 18 16 13
F 364 F3-6 Do you perform tasks on sawtooth wave generator WSC 2 3 1 7 3 0 3 3 2 38 25 21 14
F 365 F3-7 Do you perform tasks on trapezoidal (ramp) wave generator WSC 1 1 1 4 3 0 1 1 2 31 19 10 9
F 366 F3-8 Do you perform tasks on RC differentiating WSC 1 2 0 2 3 0 0 1 1 19 14 8 5
F 367 F3-9 Do you perform tasks on RL differentiating WSC 1 1 0 2 3 0 1 1 1 16 12 7 4
F 368 F3-10 Do you perform tasks on RC integrating WSC 1 2 1 4 3 0 0 1 1 20 15 6 6
F 369 F3-11 Do you perform tasks on RL integrating WSC 1 1 1 3 3 0 0 1 1 17 12 6 4
F 370 F3-12 Do you perform tasks on square wave generator WSC 2 4 1 11 3 0 3 3 3 37 24 18 16
F 371 F3-13 Do you perform tasks on rectangular wave generator WSC 1 2 1 5 0 0 1 2 1 30 14 8 13
F 372 F3-14 Do you perform tasks on Schmitt trigger WSC 1 1 1 4 2 0 1 2 1 25 16 8 8

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Task Title

452 452 452 452 452 452 452 452 452 455 455 455 456
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

- G 391 G1-3 Do you convert hexadecimal numbers to binary or
binary numbers to hexadecimal
G 392 G1-4 Do you convert octal numbers to decimal or decimal
numbers to octal
G 393 G1-5 Do you convert hexadecimal numbers to decimal or
decimal numbers to hexadecimal
G 394 G1-6 Do you convert octal numbers to hexadecimal or
hexadecimal numbers to octal
G 395 G1-7 Do you convert base number fractions to another base
numbering system

0179 40b. Math operations

B

- G 396 G1-8 Do you add binary numbers
G 397 G1-9 Do you subtract binary numbers
G 398 G1-10 Do you multiply binary numbers
G 399 G1-11 Do you divide binary numbers
G 400 G1-12 Do you add octal numbers
G 401 G1-13 Do you subtract octal numbers
G 402 G1-14 Do you add hexadecimal numbers
G 403 G1-15 Do you subtract hexadecimal numbers

0180 40c. Binary Code Systems

B

- G 404 G1-16 Do you use binary coded decimal (BCD)
G 405 G1-17 Do you use gray codes
G 406 G1-18 Do you use ICAO codes
G 407 G1-19 Do you use excess-3 (XS3) codes
G 408 G1-20 Do you use parity bit codes
G 409 G1-21 Do you use biquinary codes
G 410 G1-22 Do you use ASCII codes
G 411 G1-23 Do you use EBCDI codes

0181 41. Digital Logic Functions (Main Logic
Gates and Flip-flops)

0182 41a. Theory of operation

B

- G 412 G1-24 Do you trace data flow through logic symbol diagrams
G 413 G1-25 Do you trace data flow through logic schematic
diagrams

16 26 11 39 41 21 52 31 39 47 23 48 50
15 23 13 38 38 13 46 25 35 46 24 45 45

D T Y	Task Title																
		452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452
G 417	Do you trace data flow through circuits using positive logic (High = Binary 1)	7	12	0	21	18	10	24	12	21	38	19	21	31			
G 418	Do you trace data flow through circuits using negative logic (High = Binary 0)	8	11	1	21	16	9	19	11	20	30	18	17	27			
G 419	Do you perform tasks related to AND gates	7	27	9	28	39	16	36	26	31	53	30	39	38			
G 420	Do you perform tasks related to OR gates	7	28	8	29	39	18	36	26	30	53	30	39	37			
G 421	Do you perform tasks related to inhibited gates logic functions	5	18	6	24	20	10	26	17	19	50	25	34	31			
G 422	Do you perform tasks related to NAND or NOR gates	5	26	7	27	39	13	35	23	29	52	28	39	36			
G 423	Do you perform tasks related to exclusive OR/NOR logic functions	5	23	5	22	15	12	26	16	20	50	23	33	32			
G 424	Do you perform tasks related to RS flip flops	2	11	0	15	5	4	10	8	9	25	17	19	23			
G 425	Do you perform tasks related to D(Data) flip flops	2	9	1	10	5	4	11	8	10	26	17	19	23			
G 426	Do you perform tasks related to T(Toggle) flip flops	2	10	0	9	7	1	11	8	10	24	18	17	23			
G 427	Do you perform tasks related to JK flip flops	2	7	0	6	5	1	7	7	7	36	18	12	28			
G 428	Do you perform tasks related to Schmidt triggers	1	7	1	10	3	1	8	6	6	26	16	19	23			
G 429	Do you perform tasks related to delay (One-shot) logic functions	2	10	1	13	3	4	12	8	10	28	14	17	23			
G 430	Do you perform tasks related to open collector gates (wired "AND" or wired "OR")	4	5	0	7	7	3	8	6	9	20	17	12	16			
G 431	Do you perform tasks related to buffers	5	9	2	18	3	6	14	10	12	33	18	22	27			
G 432	Do you perform tasks related to inverters	6	16	6	15	10	4	17	16	16	38	21	29	29			
G 433	Do you perform tasks related to complemented flip flops	2	5	2	10	5	3	8	6	7	20	14	13	17			
G 434	Do you perform tasks related to complementing flip flops	2	5	2	11	5	3	8	6	7	23	14	13	17			

0183	41b. Isolate faulty logic function circuits	2b															
G 414	Do you troubleshoot digital systems to major units	16	19	12	42	25	19	41	28	33	44	23	50	53			
G 415	Do you troubleshoot digital systems subassemblies or circuit cards	4	4	1	6	2	0	7	4	7	41	22	28	32			

0184	41c. Troubleshoot circuits	2b															
G 416	Do you troubleshoot digital systems, subsystems or circuit cards to circuit level components or IC	2	2	1	6	0	0	6	4	6	26	18	8	22			

0185	41d. Logic families (TTL and CMOS)	B															
G 438	Do you perform tasks on RTL (resistor transistor logic formerly DCTL)	1	3	2	4	5	0	4	4	5	10	8	3	6			
G 439	Do you perform tasks on DTL (diode transistor logic)	1	3	3	6	5	0	5	4	5	8	8	3	5			

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Task Title

[illegible]

0192 43b. Load programs

2b

G 448 G2-2 Do you load programs

38 10 20 53 10 29 43 30 35 40 2 61 69

0193 43c. Write/debug programs

2b

G 449 52-3 Do you write or debug programs

G 449 G2-3 Do you write or debug programs

G 453 G2-7 Do you use computer flow charts or diagrams

[illegible]

0194 43d. Fault isolation

2b

G 450 G2-4 Do you troubleshoot computers to a major unit

G 450 G2-4 Do you troubleshoot computers to a major unit
G 451 G2-5 Do you troubleshoot computers to a subassembly or circuit card

27	20	15	48	18	26	32	24	31	28	3	47	61
6	8	3	6	3	3	4	6	5	28	3	48	41

0195 430. Circuit troubleshooting

2b

6 452 G2-6 Do you troubleshoot computer subassembly or circuit card to circuit level components or IC

5 7 3 5 2 0 4 4 5 12 2 6 14

0196 43f. Types of memories

Q 466 G2-20 Do you perform tasks on magnetic (tape, disc, core) computer memories

9 10 3 29 15 21 22 16 18 34 3 59 60

Q 467 computer memories
G2-21 Do you perform tasks on semiconductor (RAM, ROM, EPROM, PROM) computer memories

13 16 9 25 10 7 19 21 16 19 5 31 40

G2-22 Do you perform tasks on paper (tape, punch card) computer memories

2 2 5 4 7 2 1 9 8 5 3 0 21 5

G2-23 Do you perform tasks on advanced technology (bubble, CCD, electron beam, laser, thin film) computer memories

2 5 1 6 7 0 5 5 4 3 1 3 3

0197 43g. Peripheral devices

88

6470 G2-24 Do you perform tasks on computer keyboards

Task	Keyboard	Character printer
G2-24 Do you perform tasks on computer keyboards	470	470
G2-25 Do you perform tasks on computer character printers	471	471

Q	A
62-25 Do you perform tasks on computer character printer	471
62-26 Do you perform tasks on magnetic tape drives	472

6	16	9	27	10	24	28	22	29	19	10	23	74
4	9	3	12	2	6	8	11	13	11	7	22	39
2	7	2	12	3	1	8	6	5	13	1	24	43

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Task Title

452 452 452 452 452 452 452 452 455 455 455 456
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

0201 44b. Isolate faulty microprocessors 2b

G 486	G2-40 Do you troubleshoot microprocessor controlled systems to a subassembly or circuit card	5	5	2	3	2	3	4	4	4	9	2	8	23
G 487	G2-41 Do you troubleshoot microprocessor controlled systems to isolate a faulty microprocessor	4	5	3	3	3	6	4	4	4	7	1	3	14

0202 45. Logic Circuits

0203 45a. Theory of operation

0204 45a(1). Counters (Synchronous/
Asynchronous-Up/Down counters) B

G 488	G3-1 Do you trace data flow through circuits containing counters	7	4	5	13	10	7	14	7	7	35	18	19	25
G 491	G3-4 Do you perform tasks on UP counters in logic circuits	2	1	1	3	5	0	4	2	2	27	14	7	15
G 492	G3-5 Do you perform tasks on DOWN counters in logic circuits	2	1	0	6	3	1	3	2	2	26	14	7	15
G 493	G3-6 Do you perform tasks on DECADE counters in logic circuits	1	1	0	1	2	0	2	1	1	19	9	6	14
G 494	G3-7 Do you perform tasks on ring counters in logic circuits	1	2	0	3	3	1	1	2	1	13	4	3	6
G 495	G3-8 Do you perform tasks on modulus counters in logic circuits	1	1	0	2	2	0	1	1	1	7	3	1	6
G 496	G3-9 Do you perform tasks on synchronous (parallel) counters in logic circuits	2	1	0	6	3	0	2	2	2	19	7	4	16
G 497	G3-10 Do you perform tasks on asynchronous (serial) counters in logic circuits	2	1	1	6	3	0	2	2	2	19	6	5	15

0205 45a(2). Registers (Shift and Storage) B

G 498	G3-11 Do you trace logic diagrams of circuits containing registers	4	5	1	3	3	6	8	4	5	23	12	16	23
G 501	G3-14 Do you perform tasks on shift registers in logic circuits	2	3	0	3	2	1	0	2	0	19	9	11	21

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Task Title

452 452 452 452 452 452 452 452 452 455 455 456
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X00209 46. D/A, A/D Converters (Approx D/A and
Ramp A/D)

0210 46a. Theory of operation B

G 516 G4-1 Do you trace data flow through A/D converters
G 517 G4-2 Do you trace data flow through D/A converters
G 520 G4-5 Do the converters you perform tasks on use
flash conversion
G 521 G4-6 Do the converters you perform tasks on use
successive approximation conversion
G 522 G4-7 Do the converters you perform tasks on use
ramp conversion
G 523 G4-8 Do the converters you perform tasks on use
R2R conversion

27 24 16 27 13 21 32 26 23 26 11 48 43
27 23 34 27 11 21 28 31 22 26 10 33 43
2 2 2 1 2 1 2 2 1 6 2 2 2
1 2 2 2 5 3 4 4 4 9 4 4 9
1 2 1 3 3 0 6 3 2 11 3 4 10
1 3 1 2 2 1 2 2 1 5 1 3 5

0211 46b. Isolate faulty converters 2b

G 518 G4-3 Do you troubleshoot A/D converter circuits
G 519 G4-4 Do you troubleshoot D/A converter circuits

9 18 11 9 8 7 12 15 12 21 9 30 32
9 18 13 9 8 6 11 18 11 21 9 25 32

0212 47. Transmission Lines

0213 47a. Theory of operation B

H 527 H1-4 Do you construct transmission lines
H 528 H1-5 Do you match transmission line impedance with loads
H 531 H1-8 Do you perform tasks on open-wire transmission lines
H 532 H1-9 Do you perform tasks on twisted pair transmission
lines
H 533 H1-10 Do you perform tasks on twin lead transmission lines
H 534 H1-11 Do you perform tasks on flexible coaxial trans-
mission lines
H 535 H1-12 Do you perform tasks on rigid coaxial transmission
lines
H 536 H1-13 Do you perform tasks on fiber-optic transmission lines

8 3 16 26 3 38 30 13 22 10 1 4 14
7 2 16 6 2 26 12 7 12 3 1 5 14
20 4 10 18 8 26 24 19 19 7 1 7 5
35 9 19 24 8 29 52 34 33 11 1 12 16
13 3 10 10 3 10 19 11 13 9 1 3 4
47 7 56 58 15 78 59 49 52 17 4 25 29
33 5 41 23 3 63 38 34 41 7 1 18 9
5 1 4 2 0 6 7 6 4 5 0 0 3

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Task Title

452 452 452 452 452 452 452 452 452 455 455 456
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

0214 47b. Perform Measurements 2b

H 524 H1-1 Do you measure electrical length on transmission lines
H 525 H1-2 Do you measure physical length on transmission lines
H 526 H1-3 Do you measure standing wave ratio (SWR) on trans-
mission lines

9 4 16 15 3 38 21 12 18 6 0 6 17
12 4 19 33 3 49 34 15 26 11 3 5 20
8 3 47 13 5 62 27 25 35 5 0 5 25

0215 47c. Calculations

H 529 H1-6 Do you calculate the characteristic impedance (ZO)
of transmission lines

6 2 7 3 0 16 9 6 7 3 0 2 2

0216 47d. Isolate faulty transmission lines

H 530 H1-7 Do you troubleshoot transmission lines

28 7 50 35 10 76 43 33 35 14 3 13 16

0217 48. Waveguides

0218 48a. Theory of operation B

H 537 H1-14 Do you trace schematic or block diagrams of circuits
containing waveguides
H 539 H1-16 Do you pressurize or purge waveguide assemblies
H 540 H1-17 Do you measure standing wave ratio for waveguide
assemblies
H 541 H1-18 Do you remove or install waveguide or associated
coupling hardware components

78 13 20 77 15 66 66 52 58 8 1 73 68
81 10 16 76 11 57 69 50 58 7 1 69 72
12 7 6 18 2 47 22 12 19 3 0 14 29
86 14 15 78 10 60 68 52 56 8 2 72 75

0219 48b. Isolate faulty waveguides 2b

H 538 H1-15 Do you troubleshoot circuits to isolate a faulty
waveguide assembly

76 11 18 75 10 57 63 48 52 8 0 70 59

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Task Title

452 452 452 452 452 452 452 452 455 455 455 456
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

0220 4c Microwave Oscillators & Amplifiers

0221 49a. Theory of operation B

H 542	H2-1 Do you trace schematic or block diagrams of circuits containing microwave oscillators or amplifiers	21	5	4	33	11	10	33	14	16	6	0	52	32
H 545	H2-4 Do you perform tasks on two-cavity klystron microwave oscillators and amplifiers	1	1	0	9	0	1	2	1	6	3	0	30	7
H 546	H2-5 Do you perform tasks on three-cavity klystron microwave oscillators and amplifiers	1	2	0	3	0	0	2	1	3	2	0	18	1
H 547	H2-6 Do you perform tasks on reflex klystron microwave oscillators and amplifiers	1	1	0	23	2	0	2	1	8	4	0	23	5
H 548	H2-7 Do you perform tasks on traveling wave tube microwave oscillators and amplifiers	13	2	2	22	3	4	11	10	7	5	0	8	4
H 549	H2-8 Do you perform tasks on magnetron microwave oscillators and amplifiers	5	1	1	31	5	1	6	4	12	5	0	60	30
H 550	H2-9 Do you perform tasks on backward wave oscillator	1	1	1	3	0	0	2	1	1	2	0	5	1
H 551	H2-10 Do you perform tasks on parametric amplifiers	1	1	1	2	0	1	2	1	1	2	0	15	1
H 552	H2-11 Do you perform tasks on yttrium iron garnet (YIG) tuned microwave oscillators and amplifiers	1	1	1	1	4	0	0	4	1	0	3	0	1

0222 49b. Tune or Adjust 2b

H 544	H2-3 Do you tune or adjust microwave oscillators or amplifiers	2	1	2	26	5	1	4	2	7	5	0	49	23
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0223 49c. Isolate faulty microwave oscillators 2b or amplifiers

H 543	H2-2 Do you troubleshoot circuits to isolate a faulty microwave oscillator or amplifier	12	3	2	15	5	3	19	5	6	6	0	46	25
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0224 50. Resonant Cavities

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Task Title

452 452 452 452 452 452 452 452 452 452 455 455 455 456
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

0234 51b. Isolate faulty transmitters

H 565	H4-5 Do you troubleshoot AM transmitters to major units	11	8	38	18	7	50	12	23	23	3	1	23	3
H 566	H4-6 Do you troubleshoot AM transmitters to subassemblies or circuit cards	4	2	6	0	2	4	3	3	3	4	1	17	2
H 581	H4-21 Do you troubleshoot SSB transmitters to major units	2	0	6	10	5	53	2	7	25	1	0	1	1
H 582	H4-22 Do you troubleshoot SSB transmitters to subassemblies or circuit cards	2	0	1	0	0	6	0	1	3	1	0	1	0
H 597	H4-37 Do you troubleshoot FM transmitters to major units	12	10	36	19	5	38	15	25	17	3	3	27	7
H 598	H4-38 Do you troubleshoot FM transmitters to subassemblies or circuit cards	4	3	7	1	0	3	4	3	1	3	3	19	6
H 616	H4-56 Do you troubleshoot PM transmitters to major units	15	1	5	23	7	19	11	12	16	7	1	28	22
H 617	H4-57 Do you troubleshoot PM transmitters to subassemblies or circuit cards	2	0	2	4	0	0	2	1	1	8	1	18	14

0235 51c. Troubleshoot circuits

H 567	H4-7 Do you troubleshoot AM transmitter subassemblies or circuit cards to circuit level components	2	2	6	0	2	3	3	3	1	3	1	6	2
H 583	H4-23 Do you troubleshoot SSB transmitter subassemblies or circuit cards to circuit level components	1	0	1	0	0	4	0	1	2	1	0	1	0
H 599	H4-39 Do you troubleshoot FM transmitter subassemblies or circuit cards to circuit level components	2	3	6	0	0	1	3	2	1	3	2	9	3
H 618	H4-58 Do you troubleshoot PM transmitter subassemblies or circuit cards to circuit level components	2	0	2	4	0	0	2	1	1	5	1	9	6

0236 52. Receivers

0237 52a. Theory of operation

0238 52a(1). Amplitude Modulation

H 570	H4-10 Do you use "AM" demodulation principles	7	7	23	16	5	41	9	21	21	3	0	6	2
H 571	H4-11 Do you trace block diagrams of AM receivers	15	9	48	18	7	63	15	33	27	3	0	13	2
H 572	H4-12 Do you trace block diagrams of AM receiver subassemblies or circuit cards	5	4	11	4	3	13	5	8	7	3	0	9	1

D T Y	Tsk Y Nbr	Task Title	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452	452
H	573	H4-13 Do you trace schematic diagrams of AM receiver subassemblies or circuit cards	2	3	8	3	3	9	4	4	4	3	0	8	1			
H	577	H4-17 Do you align or adjust AM receivers or circuits	5	1	11	3	2	9	4	6	6	2	0	9	1			
0239		52a(2). Frequency Modulation	-															
H	603	H4-43 Do you use "FM" demodulation principles	8	8	29	18	5	35	15	28	17	3	3	7	3			
H	604	H4-44 Do you trace block diagrams of FM receivers	18	10	42	20	7	44	22	36	20	4	3	10	6			
H	605	H4-45 Do you trace block diagrams of FM receiver subassemblies or circuit cards	4	3	11	3	3	4	8	10	5	4	3	8	5			
H	606	H4-46 Do you trace schematic diagrams of FM receiver subassemblies or circuit cards	4	4	8	1	3	3	4	6	3	4	3	7	4			
H	610	H4-50 Do you align or adjust FM receivers or circuits	2	2	8	3	2	4	4	5	4	3	3	10	5			
H	611	H4-51 Do you plot receiver signal level curves (RSL) for FM receivers	1	1	6	1	0	1	3	3	1	1	1	2	2			
0240		52a(3). Single Side Band	-															
H	586	H4-26 Do you trace block diagrams of SSB receivers	1	0	7	9	7	59	7	8	26	1	1	1	0			
H	587	H4-27 Do you trace block diagrams of SSB receiver subassemblies or circuit cards	0	0	1	3	3	10	2	3	8	1	1	1	0			
H	588	H4-28 Do you trace schematic diagrams of SSB receiver subassemblies or circuit cards	1	0	0	3	3	4	1	2	6	1	1	1	0			
H	592	H4-32 Do you align or adjust SSB receivers or circuits	1	0	1	2	2	12	1	2	5	1	1	1	0			
0241		52a(4). Pulse Modulation	-															
H	622	H4-62 Do you use "PM" demodulation principles	5	2	8	20	2	24	10	14	14	5	1	15	9			
H	623	H4-63 Do you trace block diagrams of PM receivers	12	2	9	25	7	21	15	15	18	7	1	22	17			
H	624	H4-64 Do you trace block diagrams of PM receiver subassemblies or circuit cards	1	1	2	5	2	1	4	5	4	7	1	16	14			
H	625	H4-65 Do you trace schematic diagrams of PM receiver subassemblies or circuit cards	1	1	3	4	2	0	4	3	3	7	1	15	14			
H	629	H4-69 Do you align or adjust PM receivers or circuits	1	0	2	5	2	0	2	1	5	6	1	19	16			
0242		52b. Isolate faulty receivers	-															
H	574	H4-14 Do you troubleshoot AM receivers to major units	9	8	37	16	5	53	10	24	22	2	0	10	1			
H	575	H4-15 Do you troubleshoot AM receivers to subassemblies or circuit cards	2	2	6	0	2	4	3	3	3	2	0	7	1			
H	589	H4-29 Do you troubleshoot SSB receivers to major units	0	0	4	9	5	54	2	7	24	1	1	1	0			

[illegible]

D T Y	Task Nbr	Task Title
H 590	H4-30	Do you troubleshoot SSB receivers to sub-assemblies or circuit cards
H 607	H4-47	Do you troubleshoot FM receivers to major units
H 608	H4-48	Do you troubleshoot FM receivers to subassemblies or circuit cards
H 624	H4-66	Do you troubleshoot PM receivers to major units
H 627	H4-67	Do you troubleshoot PM receivers to subassemblies or circuit cards

52c. Troubleshoot circuits

H 576	H4-16 Do you troubleshoot AM receiver subassemblies or circuit cards to circuit level components	2	2	5	0	0	3	3	3	2	2	0	6	1
H 591	H4-31 Do you troubleshoot SSB receiver subassemblies or circuit cards to circuit level components	0	0	0	0	0	3	1	1	3	1	1	1	0
H 609	H4-49 Do you troubleshoot FM receiver subassemblies or circuit cards to circuit level components	2	2	5	1	0	1	3	3	1	3	2	5	2
H 628	H4-68 Do you troubleshoot PM receiver subassemblies or circuit cards to circuit level components	1	0	0	4	0	0	2	1	0	4	1	7	7

0244 53. Transmission Power

0245	53a. Perform measurements	B													
I 660	Il-1 Do you measure RF power	6	7	49	20	7	75	36	28	31	8	3	69	50	
I 661	Il-2 Do you measure RF peak power	4	3	26	16	2	40	15	11	14	8	3	49	45	
I 662	Il-3 Do you measure RF average power	4	3	18	10	2	32	13	13	12	7	3	36	32	
I 663	Il-4 Do you measure RF effective power	4	4	20	11	3	34	13	11	12	7	3	25	19	
I 664	Il-5 Do you measure RF output power using wattmeters	7	8	60	20	7	87	37	39	39	6	0	24	26	

53b. Calculations		B											
I 665	I2-1 Do you calculate RF apparent power	1	2	9	2	2	10	5	6	5	0	13	14
I 666	I2-2 Do you calculate RF true power	1	2	9	2	2	9	5	6	7	5	0	12
I 667	I2-3 Do you calculate RF power loss or gain in db	2	2	18	7	3	26	9	10	13	7	0	30

D
T Tsk
Y Nbr

Task Title

452 452 452 452 452 452 452 452 455 455 455 456
52A 52B 52C 53A 53B 53C 71 72 73 59A 50B X3A X0

0250 54c. Isolate faulty antennas

H 632 H5-3 Do you troubleshoot loading of antennas
H 633 H5-4 Do you troubleshoot coupling of antennas
H 635 H5-6 Do you troubleshoot antenna components9 6 17 18 3 38 11 14 18 5 0 19 14
13 5 19 23 5 47 16 18 27 5 0 20 15
19 7 27 24 7 51 30 25 30 7 0 47 55

0251 55. Microphones

0252 55a. Theory of operation

J 668 J1-1 Do you trace block diagrams of circuits
containing microphones

8 10 45 13 2 62 26 29 23 3 1 0 0

J 669 J1-2 Do you trace schematic diagrams of microphone circuits

7 8 30 9 2 29 20 20 14 3 1 0 0

J 672 J1-5 Do you work on carbon microphones

0 1 15 4 2 43 10 6 12 3 0 0 0

J 673 J1-6 Do you work on capacitor microphones

0 1 5 1 2 4 3 3 2 2 0 0 0

J 674 J1-7 Do you work on crystal microphones

2 2 5 2 0 15 4 4 1 2 0 0 0

J 675 J1-8 Do you work on dynamic microphones

1 3 13 2 2 29 8 11 11 3 1 0 1

J 676 J1-9 Do you work on velocity ribbon microphones

0 1 2 0 0 6 3 1 1 2 0 0 0

0253 55b. Isolate faulty microphones

J 670 J1-3 Do you troubleshoot to isolate a faulty microphone

5 10 32 11 2 50 21 23 21 3 1 0 0

0254 55c. Troubleshoot circuits

J 671 J1-4 Do you troubleshoot microphones

4 5 15 3 2 18 7 7 10 3 1 0 1

0255 56. Speakers

0256 56a. Theory of operation

J 677 J1-10 Do you trace block diagrams of circuits
containing speakers

1 5 30 7 3 40 17 21 16 3 4 0 0

D Task Title
Y Nbr 452 452 452 452 452 452 452 452 455 455 455 456
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

J 678 J1-11 Do you trace schematic diagrams of speaker circuits 1 4 18 6 3 25 13 15 10 3 3 0 0

0257 56b. Isolate faulty speakers -----

J 679 J1-12 Do you troubleshoot to isolate a faulty speaker 2 4 24 7 3 34 14 15 16 4 3 0 0

0258 56c. Troubleshoot circuits -----

J 680 J1-13 Do you troubleshoot speakers 0 2 12 2 3 9 6 5 5 3 2 0 0

0259 57. Photosensitive Devices -----

0260 57a. Theory of operation B -----

J 681 J2-1 Do you trace block diagrams of circuits containing photosensitive devices 9 2 0 9 0 3 14 6 4 44 49 1 19
J 682 J2-2 Do you trace schematic diagrams of photosensitive device circuits 2 1 0 2 0 1 7 3 3 45 42 1 14
J 684 J2-4 Do you adjust or calibrate photosensitive devices 1 0 0 2 0 0 1 1 0 29 21 2 7
J 685 J2-5 Do you work on photodiodes 1 1 0 0 0 1 2 1 1 38 23 0 9
J 686 J2-6 Do you work on phototransistors 1 0 0 0 0 0 1 1 0 21 12 0 5
J 687 J2-7 Do you work on phototubes 1 0 1 0 0 0 1 1 0 12 3 0 9
J 688 J2-8 Do you work on photo-SCRs 1 0 0 0 0 0 2 1 0 10 3 0 2
J 689 J2-9 Do you work on photocells (Photoconductive or Photovoltaic) 6 0 1 0 0 1 4 1 1 21 37 0 2

0261 57b. Isolate faulty photosensitive devices: 2b -----

J 683 J2-3 Do you troubleshoot to isolate a faulty photosensitive device 6 1 0 5 0 1 7 3 3 38 47 0 12

0262 58. Display Tubes -----

D
T Task
Y No:

Task Title

452 452 452 452 452 452 452 452 452 455 455 455 456
52A 52B 52C 53A 53B 53C 71 72 73 50A 50B X3A X0

0263 58a. Theory of operation

J 690 J3-1 Do you trace block diagrams of circuits containing display tubes 12 2 8 31 2 3 13 8 13 4 2 29 19
J 691 J3-2 Do you trace schematic diagrams of display tubes or circuits 7 1 3 10 2 1 7 4 4 4 2 24 14
J 693 J3-4 Do you adjust or calibrate display tubes or circuits 4 0 3 5 2 0 3 1 2 3 0 19 12
J 694 J3-5 Do you work on direct view storage tubes (DVST) 7 0 4 21 3 0 5 3 8 3 1 27 0
J 695 J3-6 Do you work on multiple mode storage tubes (MMST) 7 0 3 2 0 0 7 2 3 2 0 0 0
J 696 J3-7 Do you work on scan converter tubes (SCT) 4 0 4 8 0 0 2 3 2 1 0 16 19

0264 58b. Isolate faulty display tubes

J 692 J3-3 Do you troubleshoot to isolate a faulty display tube 8 1 6 20 0 3 8 4 3 3 3 25 14

0265 59. Support Subjects

0266 59a. Safety applicable to electronics B

0267 59b. First aid for electrical shock B

0268 59c. Electrostatic Discharge (ESD) Control B

0269 Tasks not referenced

B 175 B3-4 Do you use audio sine-wave signal generators 0 2 4 4 4 2 3 2 2 5 14 29 5 5
B 176 B3-5 Do you use audio non-sinusoidal signal generators 0 1 2 4 4 2 1 1 3 2 5 3 6
B 177 B3-6 Do you use RF less than 1,000MH signal generators 1 1 5 9 7 10 4 4 6 10 10 15 23
B 178 B3-7 Do you use RF greater than 1,000MH signal generators 2 1 2 9 2 10 5 3 5 6 5 18 32
B 179 B3-8 Do you use white noise signal generators 0 1 2 3 2 1 1 0 3 3 8 3 1
B 180 B3-9 Do you use pattern signal generators 0 1 1 2 2 2 3 1 0 3 24 24 12 5

Report Option Table for Modules

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Report Option Table for Tasks

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Description of Reported Module Factors

Col	Factor	Source vector	Title	Module Statement	Number Members	Mean	S.D.	Based on All Tasks Within Range	Min	Max	Valid
1	TITLE										

Description of Reported Task Factors

Col	Factor	Source vector	Title	Task Statement	Number Members	Mean	S.D.	Based on All Tasks Within Range	Min	Max	Valid
1	TITLE										
2	F0102	GP0142/PHP		All DAFSC 456X2A	29	18.16	26.31	100.00	.00		712
3	F0106	GP0149/PHP		All DAFSC 456X2B	19	12.69	20.08	100.00	.00		712
4	F0103	GP0144/PHP		All DAFSC 457X3A	28	12.36	17.57	92.86	.00		712
5	F0105	GP0146/PHP		All DAFSC 457X3C	19	12.43	19.01	100.00	.00		712
6	F0076	GP0079/PHP		All DAFSC 46150	1034	.82	3.24	34.82	.00		712
7	F0077	GP0080/PHP		All DAFSC 46250	1616	2.59	8.68	69.99	.00		712
8	F0078	GP0081/PHP		All DAFSC 46350	347	1.58	5.96	53.89	.00		712
9	F0079	GP0082/PHP		All Reporting Identifier 99104	144	29.41	22.62	93.75	.00		712
10	F0080	GP0083/PHP		All Reporting Identifier 99105	206	4.18	9.32	81.55	.00		712
11	F0081	GP0084/PHP		All Reporting Identifier 99106	119	2.47	7.29	75.63	.00		712

Electronic Principles Inventory (EPI) data for Air Force specialties is presented below in Electronic Fundamentals/Applications order. Data for this report was collected from job incumbents during the period March 1987 - April 1989

Percent members responding "YES" is shown for each specialty listed. Where skill level is not specified, both 5 and 7 skill levels are included (e.g., DAFSC 000X0 includes 00050 and 00070).

For assistance in using this EPI printout phone USAFOMC/OMYA, at AUTOVON 487-6623.

D	T Task	Y Nbr	Task Title	456	456	457	457	461	462	463	991	991	991
				X2A	X2B	X3A	X3C	50	50	50	04	05	06

0001 STS 1 Electronic Fundamentals/
Applications dated 20 Feb 1987

0002 1. Basic Terms

0003 1a. Metric Notation B

A	1	Al-1 Do you use metric terms (example mili, kilo, mega)	55	53	68	89	17	19	45	87	82	76
---	---	---	----	----	----	----	----	----	----	----	----	----

0004 1b. DC Terms B

A	2	Al-2 Do you use basic DC electrical/electronic terms	100	95	89	100	32	70	54	93	44	45
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0005 1c. AC Terms B

A	3	Al-3 Do you use basic AC electrical/electronic terms	100	95	86	100	30	61	52	94	43	45
---	---	--	-----	----	----	-----	----	----	----	----	----	----

0006 2. Basic Circuits

PM0038

PRIMOD Lowry TTC AFSCs matched to EF/A STS (3 of 3)

D
T Task
Y Nbr

456 456 457 457 461 462 463 991 991 991
X2A X2B X3A X3C 50 50 50 04 05 06

Task Title

0007 2a. Theory of operation

B

A 4 A1-4 Do you trace schematic or block diagrams of circuits
containing conductors, fuses, lamps, switches, or batteries

97 100 89 68 10 60 38 85 16 20

0008 2b. Troubleshoot circuits

2b

A 5 A1-5 Do you troubleshoot circuits containing conductors,
fuses, lamps, switches, or batteries

97 100 79 58 16 62 39 80 11 18

0009 3. Basic Circuit Calculations

0010 3a. DC

B

A 6 A1-6 Do you calculate values of DC voltage, current, resist-
ance, or power

38 47 29 16 12 16 8 61 8 8

A 12 A1-12 Do you calculate the value of a resistor required
for a circuit

21 11 4 0 2 9 2 41 2 5

0011 3b. AC

B

A 7 A1-7 Do you calculate values of AC effective voltage,
average voltage, or peak-to-peak voltage

48 47 29 16 3 11 3 59 6 6

A 8 A1-8 Do you calculate values of frequency, phase
relationship, or wave length

48 58 21 26 1 5 2 55 15 5

0012 4. Resistors

0013 4a. Theory of operation

B

A 9 A1-9 Do you trace schematic or block diagrams of circuits
containing resistors

93 84 46 16 2 38 11 82 11 7

D
T Task
Y Nbr

Task Title

A 11 A1-11 Do you calibrate or adjust circuits by using variable resistors

456 456 457 457 461 462 463 991 991 991
X2A X2B X3A X3C 50 50 50 04 05 06

72 74 11 0 1 8 6 72 6 5

0014 4b. Isolate faulty resistors

2b

A 10 A1-10 Do you troubleshoot circuits to isolate a faulty resistor

59 42 29 5 2 32 10 69 4 6

A 14 A1-14 Do you ohm check resistors

79 74 32 5 9 29 14 72 4 8

0015 4c. Color code

B

A 13 A1-13 Do you determine ohmic value of a resistor using the color code

55 32 18 0 1 15 3 69 3 5

0016 5. Relays/Solenoids

0017 5a. Relay theory of operation

B

A 15 A1-15 Do you trace schematic or block diagrams of circuits containing relays

97 79 93 42 2 50 13 74 10 9

A 17 A1-17 Do you adjust relays

31 32 4 0 1 7 6 28 1 2

A 18 A1-18 Do you perform tasks on contacts, cores, coils, armatures, or springs

24 32 14 11 2 9 6 40 2 3

0018 5b. Isolate faulty relays

2b

A 16 A1-16 Do you troubleshoot circuits to isolate a faulty relay

76 68 93 37 2 49 15 65 5 7

A 19 A1-19 Do you continuity check relays

83 79 57 26 4 42 19 60 3 3

0019 5c. Solenoid theory of operation

A 77 A2-33 Do you trace schematic or block diagrams of circuits containing solenoids

79 47 29 0 1 36 13 49 4 9

A 79 A2-35 Do you perform maintenance on solenoid component parts

38 11 4 0 1 16 9 35 1 6

D	T	Y	Tsk	Nbr
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Task Title

456	456	457	457	461	462	463	991	991
X2A	X2B	X3A	X3C	50	50	50	04	05
								06

0020 5cd. Isolate faulty solenoids

A 78 A2-34 Do you troubleshoot circuits to isolate a faulty solenoid

76	47	21	0	1	37	17	44	2	10
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0021 6. Inductors

0022 6a. Theory of operation

A 20 A1-20 Do you trace schematic or block diagrams of circuits containing inductors, chokes, or choke coils

A 25 A1-25 Do you calibrate or adjust circuits by using variable inductors

48	32	18	16	0	4	1	71	5	5
7	11	4	0	0	1	0	34	1	2

0023 6b. Isolate faulty inductors

2b

A 21 A1-1 Do you troubleshoot circuits to isolate a faulty inductor, choke, or choke coil

A 26 A1-26 Do you ohm check inductors

31	11	14	0	0	3	0	60	1	3
24	21	14	5	1	3	1	56	1	3

0024 6c. Calculations

63

22 A1-22 Do you calculate values of circuit total inductance

23 A1-23 Do you calculate values of circuit or component inductive reactance

24 A1-24 Do you calculate values of circuit voltage or current in circuits containing inductors

3	0	4	0	0	1	0	26	0	1
3	0	4	0	0	1	0	24	1	1
3	0	4	0	0	1	0	30	1	1

7. Capacitors

D
T Task
Y Nbr

Task Title

456 456 457 457 461 462 463 991 991 991
X2A X2B X3A X3C 50 50 50 04 05 06

0032 8b. Isolate faulty transformers

2b

A 36 A1-36 Do you troubleshoot circuits to isolate a faulty transformer

76 47 79 47 1 9 2 67 3 4

A 40 A1-40 Do you ohm check transformers

52 42 50 37 1 6 2 61 2 3

A 41 A1-41 Do you measure transformer output voltage

86 47 64 42 1 6 2 65 3 4

0033 8c. Calculations

A 37 A1-37 Do you calculate transformer voltage or current step-up or step-down ratios

28 16 29 5 0 2 0 41 1 2

A 38 A1-38 Do you calculate impedance of transformers

10 5 18 0 0 1 0 21 0 2

0034 9. Three Phase Transformers

0035 9a. Theory of operation

B

A 42 A1-42 Do you trace schematic or block diagrams of circuits containing three phase transformers

59 42 57 21 0 3 1 35 0 3

A 44 A1-44 Do you adjust three phase transformers

21 21 11 5 0 1 1 15 0 2

0036 9b. Isolate faulty three phase transformers

A 43 A1-43 Do you troubleshoot circuits to isolate a faulty three phase transformer

55 32 57 26 0 3 1 31 0 3

0037 10. DC Motors

0038 10a. Theory of operation

B

A 45 A2-1 Do you trace schematic or block diagrams of circuits containing DC motors

90 42 32 5 1 4 1 60 4 4

D T Y	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	463 50	491 04	491 05	491 06
0046	12a. Theory of operation											
A 53	A2-9 Do you trace schematic or block diagrams of circuits containing DC generators	45	26	4	0	0	1	1	15	2	1	
A 56	A2-12 Do you perform tasks on component parts of DC generators	14	5	0	0	0	1	1	11	0	0	
0047	12b. Isolate faulty DC generators											
A 54	A2-10 Do you troubleshoot to isolate a faulty DC generator	38	26	0	0	0	1	2	14	0	0	
0048	12c. Troubleshoot DC generators											
A 55	A2-11 Do you troubleshoot DC generator component parts	14	21	0	0	0	1	1	11	0	0	
0049	13. AC Generators											
0050	13a. Theory of operation											
A 57	A2-13 Do you trace schematic or block diagrams of circuits containing AC generators	59	16	7	0	0	1	1	22	3	1	
A 60	A2-16 Do you perform tasks on component parts of AC generators	21	11	0	0	0	1	1	16	1	0	
0051	13b. Isolate faulty AC generators											
A 58	A2-14 Do you troubleshoot circuits to isolate a faulty AC generator	52	16	4	0	0	1	1	21	1	0	
0052	13c. Troubleshoot AC generators											
A 59	A2-15 Do you troubleshoot AC generator component parts	21	11	0	0	0	0	1	15	0	0	

D T Task Y Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	463 04	991 05	991 06

0053 14. Alternators

0054 14a. Theory of operation

A 61	A2-17 Do you trace schematic or block diagrams of circuits containing alternators	0	0	0	0	0	0	0	0	8	1	0
A 64	A2-20 Do you perform tasks on component parts of alternators	0	0	0	0	0	0	0	0	6	0	0

0055 14b. Isolate faulty alternators

A 62	A2-18 Do you troubleshoot circuits to isolate a faulty alternator	0	0	0	0	0	0	0	0	8	0	0
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0056 14c. Troubleshoot alternators

A 63	A2-19 Do you troubleshoot alternator component parts	0	0	0	0	0	0	0	0	6	0	0
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0057 15. Synchro/Servos

0058 15a. Theory of operation B

A 65	A2-21 Do you trace schematic or block diagrams of circuits containing synchros or servos	100	79	39	11	0	1	1	1	30	3	1
A 68	A2-24 Do you perform tasks on component parts of synchros or servos	38	32	14	0	1	1	1	1	19	0	0

0059 15b. Isolate faulty synchro/servos 2b

A 66	A2-22 Do you troubleshoot circuits to isolate a faulty synchro or servo	100	95	32	11	1	1	1	1	28	0	1
------	---	-----	----	----	----	---	---	---	---	----	---	---

D Task Title
 T 456 456 457 457 461 462 463 991 991 991
 Y Mbr X2A X2B X3A X3C 50 50 04 05 06

0060 15c. Troubleshoot synchro/servos 2b

A 67 A2-23 Do you troubleshoot synchro or servo component parts 41 58 14 0 0 1 1 20 0 0

0061 16. Choppers (Synchronous Vibrators)

0062 16a. Theory of operation B

A 69 A2-25 Do you trace schematic or block diagrams of circuits containing choppers 3 0 7 0 0 0 0 8 2 0

0063 16b. Isolate faulty choppers 2b

A 70 A2-26 Do you troubleshoot circuits to isolate a faulty chopper 3 0 11 0 0 0 0 6 0 0
 A 71 A2-27 Do you measure chopper coil excitation frequency 3 0 4 0 0 0 0 6 0 0
 A 72 A2-28 Do you measure chopper coil voltage-current phase relationship 3 0 4 0 0 0 0 4 0 0

0064 17. Transducers

0065 17a. Theory of operation B

A 73 A2-29 Do you trace schematic or block diagrams of circuits containing transducers 7 37 29 0 0 1 0 40 2 1
 A 75 A2-31 Do you calibrate or adjust transducers 3 11 7 0 2 1 0 37 0 3
 A 76 A2-32 Do you repair, clean or lubricate transducers 7 16 7 0 1 1 0 38 0 1

0066 17b. Isolate faulty transducers 2b

A 74 A2-30 Do you troubleshoot circuits to isolate a faulty transducer 10 37 14 0 1 1 0 7 0 1

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Y Nbr

Task Title

456 456 457 457 461 462 463 991 991 991
X2A X2B X3A X3C 50 50 50 04 05 06

0067 18. Meter Movements

0068 18a. Theory of operation B

A 80 A2-36 Do you trace schematic or block diagrams of circuits
containing meter movements 17 11 18 0 1 7 4 54 4 6
A 82 A2-38 Do you perform maintenance on meter movement
mechanical parts 7 16 11 0 1 4 4 22 1 3

0069 18b. Isolate faulty meter movements 2b

A 81 A2-37 Do you troubleshoot circuits to isolate a faulty
meter movement 17 11 18 5 2 8 6 49 2 5

0070 19. Solid State Diodes

0071 19a. Theory of operation B

A 83 A3-1 Do you trace schematic or block diagrams of circuits
containing diodes 66 68 61 21 1 20 2 77 11 8

0072 19b. Isolate faulty solid state diodes 2b

A 84 A3-2 Do you troubleshoot circuits to isolate a faulty diode 31 42 46 5 1 19 1 67 3 5
A 85 A3-3 Do you check diodes using an ohmmeter 34 53 43 0 1 18 1 70 2 4

0073 19c. Specifications B

A 86 A3-4 Do you use diode characteristic curves
A 87 A3-5 Do you use diode substitution information 3 11 4 0 0 1 0 35 1 1
3 5 7 0 0 2 0 49 2 3

D	Task Title	456	456	457	457	461	462	463	991	991	991
T		X2A	X2B	X3A	X3C	50	50	50	04	05	06
Y		Nbr									

0081 21b. Isolate faulty integrated circuits 2b

A	96	A3-14 Do you troubleshoot circuits to isolate a faulty IC	17	26	14	0	1	8	2	67	3	4
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0082 21c. Specifications B

A	97	A3-15 Do you use IC substitution information	7	21	11	0	0	2	1	60	3	4
---	----	--	---	----	----	---	---	---	---	----	---	---

0083 22. Solid State Special Purpose Devices
(SCR, Zener Diode, Tunnel Diode, LED,
LCD, UJT, JFET, MOSFET)

0084 22a. Theory of operation B

A	98	A3-16 Do you trace schematic or block diagrams of circuits containing solid-state special purpose devices	24	26	29	16	0	4	2	67	9	3
A	100	A3-18 Do you perform tasks on varactors/varicaps	3	5	0	0	0	0	0	20	2	2
A	101	A3-19 Do you perform tasks on tunnel diodes	3	0	4	0	0	0	0	24	1	1
A	102	A3-20 Do you perform tasks on field effect transistors (FET)	3	5	14	0	0	0	0	57	4	3
A	103	A3-21 Do you perform tasks on unijunction transistors (UJT)	3	9	4	0	0	0	0	38	1	2
A	104	A3-22 Do you perform tasks on zener diodes	17	11	25	0	0	2	0	68	3	3
A	105	A3-23 Do you perform tasks on liquid crystal displays (LCD)	7	0	14	0	0	1	1	42	2	2
A	106	A3-24 Do you perform tasks on pin diodes	3	11	18	0	0	1	0	16	1	1
A	107	A3-25 Do you perform tasks on light emitting diodes (LED)	7	47	36	5	0	2	1	68	5	3
A	108	A3-26 Do you perform tasks on fantail transistors	0	0	7	0	0	0	0	13	1	0
A	109	A3-27 Do you perform tasks on silicon controlled rectifiers (SCR)	0	11	7	0	0	1	0	65	2	1
A	110	A3-28 Do you perform tasks on triacs	0	0	0	0	0	0	0	36	2	1
A	111	A3-29 Do you perform tasks on programmable unijunction transistors (PUT)	0	0	7	0	0	0	0	5	1	0
A	112	A3-30 Do you perform tasks on silicon controlled switches (SCS)	3	0	0	0	0	0	0	17	2	1
A	113	A3-31 Do you perform tasks on silicon unilateral switches (SUS)	3	0	0	0	0	0	0	6	1	0
A	114	A3-32 Do you perform tasks on step recovery diodes (SRD)	3	0	7	0	0	0	0	1	1	0
A	115	A3-33 Do you perform tasks on field effect diodes (FED)	3	0	14	0	0	0	0	13	1	0
A	116	A3-34 Do you perform tasks on DIAC (Bi-directional trigger diode)	3	0	0	0	0	0	0	14	2	0
A	117	A3-35 Do you perform tasks on varistors	7	21	4	0	0	1	0	33	2	0
A	118	A3-36 Do you perform tasks on metal oxide varistors (MOV)	3	0	0	0	0	0	0	20	1	0

D Tsk
Y Nbr Task Title
A 119 A3-37 Do you perform tasks on schottky diodes
456 456 457 457 461 462 463 991 991 991
X2A X2B X3A X3C 50 50 50 04 05 06
3 0 18 0 0 0 0 26 1 0

0085 22b. Isolate faulty special purpose devices 2b

A 99 A3-17 Do you troubleshoot circuits to isolate a faulty solid-state special purpose device
14 16 25 0 0 3 2 60 2 3

0086 23. Electron Tubes

0087 23a. Theory of operation B

A 120 A4-1 Do you trace block diagrams of circuits containing electron tubes
A 121 A4-2 Do you trace schematic diagrams of electron tube circuits
A 125 A4-6 Do you perform tasks on diode tubes
A 124 A4-7 Do you perform tasks on triode tubes
A 127 A4-8 Do you perform tasks on pentode tubes
A 128 A4-9 Do you perform tasks on pentode tubes
A 129 A4-10 Do you perform tasks on beam power tubes
A 130 A4-11 Do you perform tasks on gas tubes
A 131 A4-12 Do you perform tasks on phantastons
A 132 A4-13 Do you perform tasks on neon tubes
A 133 A4-14 Do you perform tasks on xenon tubes
A 134 A4-15 Do you perform tasks on nixie tubes
97 21 11 5 0 0 0 13 2 1
86 11 7 0 0 0 0 12 1 1
28 0 4 0 0 1 0 10 0 0
21 0 4 0 0 0 0 9 0 0
10 0 4 0 0 0 0 8 0 0
24 0 0 0 0 0 0 8 0 0
14 0 0 0 0 0 0 4 0 1
24 0 4 0 0 0 0 7 0 3
10 0 0 0 0 0 0 1 0 0
7 0 0 0 0 0 0 3 0 0
7 0 0 0 0 0 0 2 0 3
3 0 4 0 0 0 0 5 0 0

0088 23b. Isolate faulty tubes

A 122 A4-3 Do you troubleshoot circuits to isolate a faulty electron tube
86 11 11 0 0 0 0 12 0 1

0089 23c. Specifications

A 123 A4-4 Do you use electron tube characteristic curves
A 124 A4-5 Do you use electron tube substitution manuals or charts
3 0 4 0 0 0 0 6 0 2
17 0 4 0 0 0 0 8 0 0

D T Tsk 456 456 457 457 461 462 463 991 991 991
 Y Nbr X2A X2B X3A X3C 50 50 50 04 05 06
 Task Title

0090 24. Cathode Ray Tubes (CRT)

0091 24a. Theory of operation B

A 135 A4-16 Do you trace block diagrams of circuits containing cathode ray tubes (CRT) 90 58 25 26 0 0 0 22 3 0
 A 136 A4-17 Do you trace schematic diagrams of CRT circuits 93 42 18 11 0 0 0 21 1 0
 A 138 A4-19 Do you adjust or calibrate circuits that control-CRT operations 90 47 7 0 0 0 0 19 1 1
 A 139 A4-20 Do you perform tasks on electrostatic CRT 28 26 7 5 0 0 0 11 1 0
 A 140 A4-21 Do you perform tasks on electromagnetic CRT 14 11 11 11 0 0 0 12 2 1

0092 24b. Isolate faulty CRTs 2b

A 137 A4-18 Do you troubleshoot to isolate a faulty CRT 86 47 21 21 0 0 0 20 1 1

0093 25. Solder/Desolder

0094 25a. Terminal connections 2b

A 141 A5-1 Do you solder or desolder hardware connections 100 84 39 68 6 44 27 78 5 9
 A 142 A5-2 Do you solder or desolder component connections such as resistors, capacitors, diodes, transformers, etc 59 58 25 0 2 27 8 76 4 8

0095 25b. P C Boards 2b

A 143 A5-3 Do you solder or desolder printed circuit board connections 14 32 18 0 1 10 2 69 2 5
 A 144 A5-4 Do you solder or desolder multi-layer circuit board connections 10 11 14 0 0 5 1 38 1 3
 A 145 A5-5 Do you perform high reliability soldering 31 42 25 26 2 25 10 63 1 3

PRTMOD

Lowry TTC AFSCs matched to EF/A STS (3 of 3)

PM0038

Occupational Analysis Program
USAFOMC (ATC) Randolph AFB TX

Page 17

D
T Tsk
Y Nbr

Task Title

456 456 457 457 461 462 463 991 991 991
X2A X2B X3A X3C 50 50 50 04 05 06

0096 25c. Multipin connectors

2b

A 149 A5-9 Do you repair or fabricate connectors or cables on
multiconductor cables 66 26 57 68 3 16 15 69 4 3
A 152 A5-12 Do you repair or fabricate connectors or cables on
ribbon cables 3 16 7 5 1 2 5 61 4 5

0097 25d. Coaxial connectors

A 150 A5-10 Do you repair or fabricate connectors or cables on
coaxial cables 100 100 54 74 2 22 21 65 4 6
A 151 A5-11 Do you repair or fabricate connectors or cables on
triaxial cables 10 5 21 32 1 7 7 19 0 1

0098 26. Assemble Solderless Connectors

0099 26a. Crimp

2b

A 146 A5-6 Do you use crimping tool to repair or make connections 97 95 79 79 11 51 19 79 4 9
A 147 A5-7 Do you use wire wrap tool to make connections 31 32 25 5 3 19 7 69 4 4
A 148 A5-8 Do you use punch-on tool to make connections 21 11 11 5 1 12 4 31 1 2

0100 26b. Coaxial

2b

A 150 A5-10 Do you repair or fabricate connectors or cables on
coaxial cables 100 100 54 74 2 22 21 65 4 6
A 151 A5-11 Do you repair or fabricate connectors or cables on
triaxial cables 10 5 21 32 1 7 7 19 0 1

0101 26c. Multipin

2b

A 149 A5-9 Do you repair or fabricate connectors or cables on
multiconductor cables 66 26 57 68 3 16 15 69 4 3
A 152 A5-12 Do you repair or fabricate connectors or cables on
ribbon cables 3 16 7 5 1 2 5 61 4 5

D	T	Task	Task Title	456	456	457	457	461	462	463	991	991	991	991
Y	Nbr			X2A	X2B	X3A	X3C	50	50	50	04	05	06	

0102 27. Use Test Equipment Usage

0103 27a. Multimeter, analog 2b

B 153	B1-1 Do you use the multimeter to measure DC voltage values	100	100	71	74	27	68	44	81	4	4	11
B 154	B1-2 Do you use the multimeter to measure AC voltage values	100	100	68	74	18	58	34	81	4	4	9
B 155	B1-3 Do you use the multimeter to extend the range of voltmeters using external shunts	59	26	11	26	7	12	9	26	0	5	
B 156	B1-4 Do you use the multimeter to measure DC current values	100	84	43	42	23	47	33	70	3	8	
B 157	B1-5 Do you use the multimeter to measure AC current values	90	84	43	42	15	41	26	71	3	6	
B 158	B1-6 Do you use the multimeter to extend the range of ammeters using external shunts	28	0	7	21	5	7	7	23	0	2	
B 159	B1-7 Do you use the multimeter to measure circuit resistance	100	74	75	53	35	48	53	69	4	10	
B 160	B1-8 Do you use the multimeter to measure component resistance	97	74	64	21	26	40	47	75	3	8	

0104 27b. Oscilloscope 2h

B 161	B2-1 Do you use the oscilloscope to measure time to determine frequency	79	79	21	68	0	3	0	69	16	3
B 162	B2-2 Do you use the oscilloscope to measure time (rise, fall, pulse width, etc)	100	74	29	79	0	4	1	71	24	4
B 163	B2-3 Do you use the oscilloscope to measure AC voltage	97	63	29	53	1	4	0	68	4	7
B 164	B2-4 Do you use the oscilloscope to measure DC voltage	90	63	29	53	1	4	0	72	8	8
B 165	B2-5 Do you use the oscilloscope to measure ripple voltages	48	37	21	53	0	2	0	63	3	3
B 166	B2-6 Do you use the oscilloscope to measure phase jitters	17	58	21	21	0	0	0	35	0	2
B 167	B2-7 Do you use the oscilloscope to observe signal/data patterns	66	53	25	58	0	1	0	65	15	8
B 168	B2-8 Do you use the oscilloscope to observe lissajous patterns	14	0	11	5	0	0	0	15	1	1
B 169	B2-9 Do you use the oscilloscope to observe phase relationships	55	58	21	32	0	1	0	63	10	2
B 170	B2-10 Do you use attenuator probes with oscilloscopes	66	32	21	68	0	1	0	51	3	4
B 171	B2-11 Do you use delay time multipliers with oscilloscopes	14	32	18	11	0	1	0	24	5	1

0105 27c. Signal Generator 2b

B 172	B3-1 Do you use signal generators (SG) to perform operational checks	48	37	11	47	2	1	1	65	14	1
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D	T Tsk	Task Title	456	456	457	457	461	462	463	991	991
Y Nbr			X2A	X2B	X3A	X3C	50	50	50	04	05
B 173	B3-2	Do you use SG to perform alignments, adjustments, or calibrations	48	37	14	16	1	1	0	66	16
B 174	B3-3	Do you use SG to troubleshoot circuits	45	16	11	37	1	1	0	58	5
0106	27d.	Frequency counter									
B 185	B4-1	Do you use frequency counters	93	58	18	26	1	2	2	69	3
0107	27e.	Spectrum Analyzer									
B 186	B4-2	Do you use spectrum analyzers	48	53	18	84	0	0	1	36	4
0108	27f.	Field strength tester									
B 187	B4-3	Do you use field strength testers	7	0	0	5	0	1	0	12	1
0109	27g.	Multimeter, digital									
B 188	B4-4	Do you use digital multimeters	100	79	68	79	9	33	28	79	5
0110	27h.	Digital logic probe									
B 189	B4-5	Do you use digital logic probes	3	11	4	16	0	1	1	57	2
0111	27i.	Capacitor tester									
B 190	B4-6	Do you use capacitance testers	10	0	4	0	0	1	9	41	0
0112	27j.	Capacitor substitution box									
B 191	B4-7	Do you use capacitor substitution boxes	3	0	0	0	0	0	0	16	0

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Y Nbr

Task Title

456 456 457 457 461 462 463 991 991 991
X2A X2B X3A X3C 50 50 04 05 06

0113 27k. DC restorer

B 192 B4-8 Do you use DC restorers (CRT rejuvenators)

0 0 0 0 0 0 0 0 1 0 0

0114 27l. Logic current tracer

B 193 B4-9 Do you use logic current tracers

0 0 0 0 21 0 0 0 33 0 1

0115 27m. Tube tester

B 194 B4-10 Do you use tube testers

48 0 7 5 0 0 0 0 7 0 0

0116 27n. Logic pulser

B 195 B4-11 Do you use logic pulsers

3 0 0 11 0 0 0 1 46 1 0

0117 27o. Logic analyzer

2b

B 196 B4-12 Do you use logic analyzers

3 11 0 47 0 0 0 1 33 2 0

0118 27p. Signature analyzer

B 197 B4-13 Do you use signature analyzers

10 0 0 5 0 0 0 0 15 0 0

0119 27q. Reflectometer

2b

B 198 B4-14 Do you use reflectometers

34 5 14 47 0 1 0 15 0 0

0120 28. Transistor Amplifier Circuits (Common
Emitter, Common Collector, Common Base)

D
 T Task
 Y Nbr

Task Title

456 456 457 457 461 462 463 991 991 991
 X2A X2B X3A X3C 50 50 05 04 05 06

0121 28a. Theory of operation

0122 28a(1). Amplifier circuits B

C 19) C1-1 Do you trace block diagrams of circuits containing transistor amplifiers 28 42 14 16 0 1 0 64 7 2

C 200 C1-2 Do you trace schematic diagrams of transistor amplifier circuits 24 21 11 5 0 0 0 65 6 1

C 204 C1-6 Do you adjust or align transistor amplifiers 7 16 7 0 0 0 0 47 2 1

C 206 C1-8 Do you calculate values of transistor amplifier voltage, current or power gain 3 5 4 0 0 0 0 34 1 1

C 207 C1-9 Do you work on compound-connected (Darlington Pair) transistor amplifiers 3 16 0 5 0 0 0 45 2 1

C 208 C1-10 Do you work on cascade-connected transistor amplifiers 3 16 4 5 0 0 0 41 2 0

C 209 C1-11 Do you work on paraphase transistor amplifiers 3 11 0 0 0 0 0 13 1 0

C 210 C1-12 Do you work on push-pull transistor amplifiers 7 16 7 0 0 0 0 53 2 1

C 211 C1-13 Do you work on audio transistor amplifiers 0 11 0 0 0 0 0 35 2 0

C 212 C1-14 Do you work on wideband transistor amplifiers 3 11 0 5 0 0 0 32 2 0

C 213 C1-15 Do you work on IF transistor amplifiers 21 37 7 11 0 0 0 26 2 0

C 214 C1-16 Do you work on RF transistor amplifiers 17 37 11 11 0 0 0 28 2 0

C 215 C1-17 Do you work on buffer transistor amplifiers 7 16 7 5 0 0 0 49 1 0

C 216 C1-18 Do you work on complementary symmetry transistor amplifiers 3 16 0 0 0 0 0 29 2 0

C 217 C1-19 Do you work on DC transistor amplifiers (switching applications) 7 21 11 5 0 0 0 42 3 1

0123 28a(2). Stabilization circuits B

C 218 C2-1 Do you trace schematic diagrams of amplifier stabilization circuits 3 5 7 0 0 0 0 42 3 0

C 220 C2-3 Do you perform tasks on emitter (swamping) resistor stabilization amplifiers 3 11 0 0 0 0 0 42 0 0

C 221 C2-4 Do you perform tasks on self-bias stabilization amplifiers 7 0 0 0 0 0 0 36 0 0

C 222 C2-5 Do you perform tasks on thermistor stabilization amplifiers 0 11 4 0 0 0 0 28 0 0

C 223 C2-6 Do you perform tasks on diode stabilization amplifiers 7 11 4 0 0 0 0 38 0 0

C 224 C2-7 Do you perform tasks on double diode stabilization amplifiers 3 0 4 0 0 0 0 21 0 0

D
 T Task
 Y Nbr Task Title

0124 28a(3). Coupling circuits B

C 225	C3-1 Do you trace block diagrams of circuits containing coupling circuits	10	21	14	16	0	1	0	57	3	1
C 226	C3-2 Do you trace schematic diagrams of coupling circuits	10	21	14	5	0	1	0	52	2	0
C 229	C3-5 Do you perform tasks on direct coupling circuits	10	21	4	0	0	0	0	55	1	1
C 230	C3-6 Do you perform tasks on capacitive-resistive coupling circuits	7	11	4	0	0	0	0	47	1	1
C 231	C3-7 Do you perform tasks on capacitive-inductive coupling circuits	3	11	4	0	0	0	0	42	0	0
C 232	C3-8 Do you perform tasks on transformer coupling circuits	10	16	11	0	0	0	0	48	0	1
C 233	C3-9 Do you perform tasks on optical coupling circuits	0	11	0	0	0	0	0	20	0	0

0125 28b. Isolate faulty amplifier circuits 2b

C 201	C1-3 Do you troubleshoot to isolate a faulty transistor amplifier	21	11	11	5	0	1	0	60	3	1
C 205	C1-7 Do you measure transistor amplifier voltage, current, or power gain	7	16	7	0	0	0	0	44	3	1
C 227	C3-3 Do you troubleshoot circuits to isolate a faulty coupling circuit	10	11	7	0	0	0	1	42	1	0

0126 28c. Troubleshoot circuits 2b

C 202	C1-4 Do you troubleshoot transistor amplifiers to circuit level components	3	5	11	0	0	0	0	51	1	1
C 203	C1-5 Do you troubleshoot transistor amplifier distortion	3	5	4	0	0	0	0	38	1	1
C 219	C2-2 Do you troubleshoot amplifier stabilization circuits to circuit level components	3	0	4	0	0	0	0	33	1	0
C 228	C3-4 Do you troubleshoot coupling circuits to circuit level components	3	5	0	0	0	0	0	40	1	0

0127 29. Electron Tube Amplifiers

D T Tsk Y Nbr	Task Title	456	456	457	457	461	462	463	991	991	991
		X2A	X2B	X3A	X3C	50	50	50	04	05	06
0128	29a. Theory of operation										
C 234	C4-1 Do you trace block diagrams of circ: its containing electron tube amplifiers	76	5	4	5	0	0	0	6	0	0
C 235	C4-2 Do you trace schematic diagrams of electron tube amplifiers	66	5	4	0	0	0	0	6	0	0
C 239	C4-6 Do you adjust or align electron tube amplifiers	17	5	0	0	0	0	0	4	0	0
C 241	C4-8 Do you calculate values of electron tube amplifier voltage, current, or power gain	3	0	0	0	0	0	0	4	0	0
C 242	C4-9 Do you perform tasks on paraphase electron tube amplifiers	7	0	0	0	0	0	0	3	0	0
C 243	C4-10 Do you perform tasks on push-pull electron tube amplifiers	10	0	0	0	0	0	0	3	0	0
C 244	C4-11 Do you perform tasks on audio electron tube amplifiers	3	0	0	0	0	0	0	2	0	0
C 245	C4-12 Do you perform tasks on voltage regulator electron tube amplifiers	48	0	4	0	0	0	0	3	0	0
C 246	C4-13 Do you perform tasks on common grid electron tube amplifiers	21	0	0	0	0	0	0	3	0	0
C 247	C4-14 Do you perform tasks on common cathode electron tube amplifiers	28	0	0	0	0	0	0	3	0	0
C 248	C4-15 Do you perform tasks on cathode follower electron tube amplifiers	31	0	0	0	0	0	0	3	0	0
0129	29b. Isolate faulty tube amplifiers										
C 236	C4-3 Do you troubleshoot to isolate a faulty electron tube amplifier	62	5	4	0	0	0	0	5	0	0
C 240	C4-7 Do you measure electron tube amplifier voltage, current, or power gain	41	0	0	0	0	0	0	4	0	0
0130	29c. Troubleshoot circuits										
C 237	C4-4 Do you troubleshoot electron tube amplifiers to circuit level components	31	0	0	0	0	0	0	5	0	0
C 238	C4-5 Do you troubleshoot electron tube amplifier distortion	7	5	0	0	0	0	0	4	0	0
0131	30. Operational Amplifiers										

D	T Task	Y Nbr	Task Title	456	455	457	457	461	462	463	991	991	991	991
				X2A	X2B	X3A	X3C	50	50	50	04	05	06	

0132 30a. Theory of operation B

C	Task	21	26	14	21	0	0	0	0	69	7	3
C 249	C5-1 Do you trace block or schematic diagrams of circuits containing operational amplifiers (op amps)	21	26	14	21	0	0	0	0	69	7	3
C 251	C5-3 Do you calculate op amp gain	0	0	0	0	0	0	0	0	33	1	0
C 252	C5-4 Do you adjust op amp bias, offsets, or drift	3	5	4	0	0	0	0	0	47	2	0
C 253	C5-5 Do you use or apply operational amplifiers for general purpose (inverting or non-inverting)	21	16	7	11	0	0	0	0	58	4	0
C 254	C5-6 Do you use or apply operational amplifiers as differential/comparators	7	16	4	11	0	0	0	0	52	3	0
C 255	C5-7 Do you use or apply operational amplifiers for summing	3	5	4	11	0	0	0	0	42	2	0
C 256	C5-8 Do you use or apply operational amplifiers for unity gain amplifier (buffer)	3	16	4	11	0	0	0	0	45	3	0
C 257	C5-9 Do you use or apply operational amplifiers as active filters	3	0	0	16	0	0	0	0	44	2	0
C 258	C5-10 Do you use or apply operational amplifiers as oscillators	7	21	4	16	0	0	0	0	42	2	0
C 259	C5-11 Do you use or apply operational amplifiers as integrators	3	16	4	11	0	0	0	0	28	1	0
C 260	C5-12 Do you use or apply operational amplifiers for differentiators	3	16	0	5	0	0	0	0	39	1	0
C 261	C5-13 Do you use or apply operational amplifiers for power supplies (voltage regulators)	24	16	11	5	1	0	1	1	54	4	2
C 262	C5-14 Do you use or apply operational amplifiers as analog/digital (A/D) digital/analog (D/A) converters	28	11	14	21	0	0	0	0	54	9	3
C 263	C5-15 Do you use or apply operational amplifiers as multivibrators	14	11	7	5	0	0	0	0	39	1	0
C 264	C5-16 Do you use or apply operational amplifiers as modulators/demodulators	17	11	7	5	0	0	0	0	37	1	0

0133 30b. Isolate faulty Op Amps

C	Task	17	0	7	0	0	0	0	58	2	2
C 250	C5-2 Do you troubleshoot to isolate a faulty op amp circuit	17	0	7	0	0	0	0	58	2	2

0134 31. Magnetic Amplifiers

D T Tsk Y Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0135	31a. Theory of operation										
C 265	C6-1 Do you trace block diagrams of circuits containing magnetic amplifiers	48	0	0	0	0	0	0	3	0	0
C 266	C6-2 Do you trace schematic diagrams of magnetic amplifier circuits	59	0	0	0	0	0	0	3	0	0
C 269	C6-5 Do you adjust magnetic amplifiers or components	7	0	0	0	0	0	0	3	0	0
0136	31b. Isolate faulty magnetic amplifiers										
C 267	C6-3 Do you troubleshoot to isolate a faulty magnetic amplifier	55	0	0	0	0	0	0	3	0	0
0137	31c. Troubleshoot circuits										
C 268	C6-4 Do you troubleshoot magnetic amplifiers to circuit level components	10	0	0	0	0	0	0	3	0	0
0138	32. Saturable Reactors										
0139	32a. Theory of operation										
C 270	C6-6 Do you trace block diagrams of circuits containing saturable reactors	0	5	0	0	0	0	0	1	0	0
C 271	C6-7 Do you trace schematic diagrams of saturable reactor circuits	0	5	0	0	0	0	0	1	0	0
C 274	C6-10 Do you adjust saturable reactor circuits or components	0	5	0	0	0	0	0	1	0	0
0140	32b. Isolate faulty saturable reactors										
C 272	C6-8 Do you troubleshoot to isolate a faulty saturable reactor	0	5	0	0	0	0	0	1	0	0

D	T	Task Title	456	456	457	457	461	462	463	991	991	991
Y	Nbr		X2A	X2B	X3A	X3C	50	50	50	04	05	06

0141 32c. Troubleshoot circuits

C 273	C6-9 Do you troubleshoot saturable reactors to circuit level components	0	5	0	0	0	0	0	0	1	0	0
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0142 33. Power Supply Circuits (Half-wave, Full-wave, Full-wave bridge)

0143 33a. Theory of operation

0144 33a(1). Rectifiers (Half-wave, Full-wave, B Full-wave bridge)

D 275	D1-1 Do you trace block diagrams of circuits containing power supplies	86	68	61	53	1	16	8	78	9	8
D 276	D1-2 Do you trace schematic diagrams of power supply circuits	100	63	54	21	1	13	7	74	6	8
D 279	D1-5 Do you align or adjust power supplies	93	53	18	0	1	3	12	72	3	6
D 280	D1-6 Do you perform tasks on half-wave rectifier power supplies	14	11	7	5	0	1	0	47	2	3
D 281	D1-7 Do you perform tasks on full-wave rectifier power supplies	24	16	11	5	0	1	0	53	2	2
D 282	D1-8 Do you perform tasks on full-wave bridge rectifier power supplies	28	16	14	5	0	1	0	61	2	3
D 283	D1-9 Do you perform tasks on three-phase rectifier power supplies	17	16	7	5	0	1	1	25	1	1

0145 33a(2). Filters (Capacitive, Inductive, B L-Section, Pi-Section)

D 288	D2-1 Do you trace block diagrams of circuits containing power supply filters	28	26	11	5	0	1	0	56	5	1
D 289	D2-2 Do you trace schematic diagrams of power supply filters	24	16	11	0	0	1	0	56	3	1
D 292	D2-5 Do you perform tasks on capacitive power supply filters	14	5	7	5	0	0	0	51	2	1
D 293	D2-6 Do you perform tasks on inductive power supply filters	7	0	7	5	0	0	0	40	1	0
D 294	D2-7 Do you perform tasks on L-type power supply filters	3	0	4	5	0	0	0	24	1	0

D T Y	Task Nbr	Task Title	456	456	457	457	461	462	463	991	991	991
			X2A	X2B	X3A	X3C	50	50	50	04	05	06
D 308		D3-10 Do you perform tasks on transistor series power supply voltage regulators with current limiting	3	11	4	5	0	0	0	40	1	1
D 309		D3-11 Do you perform tasks on crow bar power supply voltage regulators	0	0	7	0	0	0	1	50	2	1

0150		34b. Isolate faulty voltage regulators 2b										
D 301		D3-3 Do you troubleshoot circuits to isolate a faulty power supply voltage regulator	69	16	25	0	0	2	1	58	2	1

0151		34c. Troubleshoot circuits 2b										
D 302		D3-4 Do you troubleshoot power supply voltage regulators to circuit level components	24	5	7	0	0	1	0	50	1	0

0152		35. Resistive/Capacitive/Inductive (RCL) Circuits										

0153		35a. Basic operation B										
E 310		E1-1 Do you trace schematic or block diagrams of circuits containing resistive capacitive inductive (RCL) circuits	7	16	0	11	0	0	1	40	3	1

0154		35b. Resonant operation B										
E 312		E1-3 Do you trace schematic or block diagrams of circuits containing resonant RCL circuits	7	11	0	11	0	0	0	32	2	0

0155		35c. Troubleshoot circuits 2b										
E 311		E1-2 Do you troubleshoot RCL circuits to circuit level components	7	0	0	0	0	0	1	33	0	0
E 313		E1-4 Do you troubleshoot resonant RCL circuits to circuit level components	7	0	0	0	0	0	0	28	0	0

D
T Task
Y Nbr Task Title

456 456 457 457 461 462 463 991 991 991
X2A X2B X3A X3C 50 50 04 05 06

0156 35d. Calculations

B

E 314 E1-5 Do you calculate values of impedance, voltage, or
current in RCL circuits
E 315 E1-6 Do you calculate phase angle of RCL circuits
E 316 E1-7 Do you calculate values of power in RCL circuits

0157 36. Frequency Sensitive Filters (Low Pass,
High Pass, Band Pass, Band Reject)

0158 36a. Theory of operation

B

E 317 E2-1 Do you trace schematic or block diagrams of circuits
containing frequency sensitive filters
E 320 E2-4 Do you align or adjust frequency sensitive filters
E 322 E2-6 Do you perform tasks on low pass
frequency sensitive filters
E 323 E2-7 Do you perform tasks on high pass
frequency sensitive filters
E 324 E2-8 Do you perform tasks on band pass
frequency sensitive filters
E 325 E2-9 Do you perform tasks on band-reject
frequency sensitive filters
E 326 E2-10 Do you perform tasks on ferrite bead
frequency sensitive filters

0159 36b. Isolate faulty frequency sensitive
filters 2b

E 318 E2-2 Do you troubleshoot circuits to isolate a faulty
frequency sensitive filter

0160 36c. Troubleshoot circuits 2b

E 319 E2-3 Do you troubleshoot frequency sensitive filters to
circuit level components

D	T Task	Task Title	456	456	457	457	461	462	463	991	991	991
Y Nbr			X2A	X2B	X3A	X3C	50	50	50	04	05	06

0161 36d. Calculations

E 321	E2-5 Do you calculate capacitance or inductance values for specific frequency sensitive filters	0	0	0	0	0	0	0	0	19	1	0
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0162 37. Wave Generating Circuits

0163 37a. Theory of operation

0164 37a(1). Oscillators (LC, RC, Crystal) B

F 327	F1-1 Do you trace block diagrams of circuits containing oscillators	55	32	11	16	0	0	0	0	56	4	0
F 328	F1-2 Do you trace schematic diagrams of oscillator circuits	38	16	11	11	0	0	0	0	54	2	0
F 331	F1-5 Do you align or adjust oscillator circuits	41	16	7	0	0	0	0	0	52	2	0
F 332	F1-6 Do the oscillators you work with use LC tank circuits	3	0	4	5	0	0	0	0	33	2	0
F 333	F1-7 Do the oscillators you work with use RC networks	21	0	7	5	0	0	0	0	40	2	0
F 334	F1-8 Do the oscillators you work with use crystals	66	26	7	5	0	0	0	0	52	2	1
F 335	F1-9 Do the oscillators you work with use phase lock loops (PLL)	3	0	4	5	0	0	0	0	38	2	0
F 336	F1-10 Do you perform tasks on series Hartley oscillator circuits	0	0	4	0	0	0	0	0	21	1	0
F 337	F1-11 Do you perform tasks on shunt Hartley oscillator circuits	0	0	4	0	0	0	0	0	22	2	0
F 338	F1-12 Do you perform tasks on Colpitts oscillator circuits	3	0	0	0	0	0	0	0	21	2	0
F 339	F1-13 Do you perform tasks on Clapp oscillator circuits	0	0	0	5	0	0	0	0	15	1	0
F 340	F1-14 Do you perform tasks on voltage control oscillators (VCO/VTD)	10	16	11	16	0	0	0	0	42	2	0
F 341	F1-15 Do you perform tasks on crystal oscillator circuits	45	16	4	0	0	0	0	0	46	2	0
F 342	F1-16 Do you perform tasks on Wien bridge oscillator circuits	0	0	0	5	0	0	0	0	13	1	0
F 343	F1-17 Do you perform tasks on pulse generating oscillator circuits	24	0	0	5	0	0	0	0	22	2	0
F 344	F1-18 Do you perform tasks on blocked/blocking oscillator circuits	17	0	0	5	0	0	0	0	7	1	0
F 345	F1-19 Do you perform tasks on burst generators	3	0	0	0	0	0	0	0	5	1	0
F 346	F1-20 Do you perform tasks on RC phase shift oscillators	17	0	0	5	0	0	0	0	15	1	0

D
T Task
Y Nbr Task Title

0165 37a(2). Multivibrators (Astable, Bistable, B Monostable)

F 347	F2-1 Do you trace block diagrams of circuits containing multivibrators	45	16	4	11	0	0	0	0	42	3	0
F 348	F2-2 Do you trace schematic diagrams of multivibrator circuits	45	5	4	0	0	0	0	0	42	2	0
F 351	F2-5 Do you adjust or align multivibrator circuits	21	5	4	0	0	0	0	0	35	0	0
F 352	F2-6 Do the multivibrators you work with use LC tank circuits	10	0	0	5	0	0	0	0	25	1	0
F 353	F2-7 Do the multivibrators you work with use RC networks	17	0	4	5	0	0	0	0	36	2	0
F 354	F2-8 Do the multivibrators you work with use Crystals	17	11	4	5	0	0	0	0	31	1	0
F 355	F2-9 Do you perform tasks on astable (free running) multivibrators	24	0	0	5	0	0	0	0	34	2	0
F 356	F2-10 Do you perform tasks on monostable (one shot) multivibrators	10	11	4	5	0	0	0	0	35	2	0
F 357	F2-11 Do you perform tasks on bistable (flip flop) multivibrators	10	5	4	5	0	0	0	0	38	3	0
F 358	F2-12 Do you perform tasks on triggered astable multivibrators	7	5	4	5	0	0	0	0	28	2	0

0166 37a(3). Waveshaping Circuits (Schmitt Trigger, Sawtooth, RC Integ/Diff) B

F 359	F3-1 Do you trace block diagrams of circuits containing waveshaping circuits (WSC)	24	16	4	21	0	0	0	0	31	2	0
F 360	F3-2 Do you trace schematic diagrams of WSC	17	11	4	5	0	0	0	0	32	1	0
F 363	F3-5 Do you adjust or calibrate WSC	21	16	0	0	0	0	0	0	25	1	0
F 364	F3-6 Do you perform tasks on sawtooth wave generator WSC	24	11	4	11	0	0	0	0	24	2	0
F 365	F3-7 Do you perform tasks on trapezoidal (ramp) wave generator WSC	7	0	0	11	0	0	0	0	24	1	0
F 366	F3-8 Do you perform tasks on RC differentiating WSC	3	0	0	5	0	0	0	0	21	1	0
F 367	F3-9 Do you perform tasks on RL differentiating WSC	3	0	0	5	0	0	0	0	14	1	0
F 368	F3-10 Do you perform tasks on RC integrating WSC	3	0	0	5	0	0	0	0	20	1	0
F 369	F3-11 Do you perform tasks on RL integrating WSC	3	0	0	5	0	0	0	0	14	1	0
F 370	F3-12 Do you perform tasks on square wave generator WSC	28	11	4	11	0	0	0	0	30	1	0
F 371	F3-13 Do you perform tasks on rectangular wave generator WSC	10	5	0	11	0	0	0	0	22	1	0
F 372	F3-14 Do you perform tasks on Schmitt trigger WSC	14	0	4	5	0	0	0	0	31	1	0

D Task Title
 Y Nbr 456 456 457 457 461 462 463 991 991 991
 X2A X2B X3A X3C 50 50 50 04 05 06

0167 37b. Isolate faulty wave generating circuits		2b										
F 329	F1-3 Do you troubleshoot to isolate a faulty oscillator circuit	45	16	11	0	0	0	0	0	47	1	0
F 349	F2-3 Do you troubleshoot to isolate a faulty multivibrator circuit	41	0	0	0	0	0	0	0	38	1	0
F 361	F3-3 Do you troubleshoot to isolate a faulty WSC	24	11	0	0	0	0	0	0	26	0	0
0168 37c. Troubleshoot circuits		2b										
F 330	F1-4 Do you troubleshoot oscillators to circuit level components	24	0	4	0	0	0	0	0	35	1	0
F 350	F2-4 Do you troubleshoot multivibrators to circuit level components	10	0	0	0	0	0	0	0	31	1	0
F 362	F3-4 Do you troubleshoot WSC to circuit level components	10	0	0	0	0	0	0	0	22	0	0
0169 38. Limiter Circuits (Diode, Zener Diode, Transistor)												
0170 38a. Theory of operation												
F 373	F4-1 Do you trace block diagrams of circuit containing limiters	10	11	0	16	0	0	0	0	35	2	0
F 374	F4-2 Do you trace schematic diagrams of limiter circuits	7	5	0	5	0	0	0	0	35	2	0
F 381	F4-9 Do you perform tasks on series diode limiter circuits	7	0	0	5	0	0	0	0	25	1	0
F 382	F4-10 Do you perform tasks on shunt diode limiter circuits	0	0	0	5	0	0	0	0	26	1	0
F 383	F4-11 Do you perform tasks on bias limiter circuits	3	0	0	5	0	0	0	0	21	1	0
F 384	F4-12 Do you perform tasks on zener diode circuits	10	11	0	5	0	0	0	0	30	1	1
F 385	F4-13 Do you perform tasks on transistor limiter circuits	10	0	0	5	0	0	0	0	26	1	0
F 386	F4-14 Do you perform tasks on triode limiter circuits	7	0	0	5	0	0	0	0	10	0	0
0171 38b. Isolate faulty limiters		2b										
F 377	F4-5 Do you troubleshoot to isolate a faulty limiter circuit	10	0	0	5	0	0	0	0	31	0	0

D Task Title
 T
 Y Nbr 456 456 457 457 461 462 463 991 991 991 991
 X2A X2B X3A X3C 50 50 50 04 05 06

0172 38c. Troubleshoot circuits 2b

F 378 F4-6 Do you troubleshoot limiters to circuit level components 3 0 0 0 0 0 0 25 0 0

0173 39. Clamper Circuits

0174 39a. Theory of operation B

F 375 F4-3 Do you trace block diagrams of circuits containing clammers 7 5 0 11 0 0 0 32 2 0
 F 376 F4-4 Do you trace schematic diagrams of clamper circuits 0 5 0 0 0 0 0 31 2 0
 F 387 F4-15 Do you perform tasks . . diode clamper circuits 7 0 0 5 0 0 0 28 0 0
 F 388 F4-16 Do you perform tasks on bias clamper circuits 0 5 0 5 0 0 0 19 1 0

0175 39b. Isolate faulty clammers 2b

F 379 F4-7 Do you troubleshoot to isolate a faulty clamper circuit 3 0 0 0 0 0 0 29 0 0

0176 39c. Troubleshoot circuits 2b

F 380 F4-8 Do you troubleshoot clammers to circuit level components 0 0 0 0 0 0 0 23 0 0

0177 40. Digital Numbering Systems (Binary, Octal, Hexadecimal)

0178 40a. Conversions B

G 389 G1-1 Do you convert decimal numbers to binary numbers or binary numbers to decimal 0 26 50 42 0 2 1 56 32 11
 G 390 G1-2 Do you convert octal numbers to binary or binary numbers to octal 0 11 29 32 0 1 0 39 24 6

D	Tsk	Task Title	456	456	457	457	461	462	463	991	991	991
Y	Nbr		X2A	X2B	X3A	X3C	50	50	50	04	05	06
G 391		G1-3 Do you convert hexadecimal numbers to binary or binary numbers to hexadecimal	0	16	50	47	1	1	0	53	32	9
G 392		G1-4 Do you convert octal numbers to decimal or decimal numbers to octal	0	11	25	32	0	1	0	37	24	6
G 393		G1-5 Do you convert hexadecimal numbers to decimal or decimal numbers to hexadecimal	0	21	54	42	0	1	0	52	35	9
G 394		G1-6 Do you convert octal numbers to hexadecimal or hexadecimal numbers to octal	0	11	25	32	0	0	0	33	19	5
G 395		G1-7 Do you convert base number fractions to another base numbering system	0	11	18	26	0	1	1	27	14	6

0179 40b. Math operations B

G 396		G1-8 Do you add binary numbers	0	11	29	26	0	2	1	47	21	10
G 397		G1-9 Do you subtract binary numbers	0	11	25	26	0	2	1	43	20	8
G 398		G1-10 Do you multiply binary numbers	0	5	21	26	0	1	1	31	13	5
G 399		G1-11 Do you divide binary numbers	0	5	21	26	0	1	1	31	12	5
G 400		G1-12 Do you add octal numbers	0	0	21	26	0	1	0	28	17	5
G 401		G1-13 Do you subtract octal numbers	0	0	21	26	0	1	0	28	17	5
G 402		G1-14 Do you add hexadecimal numbers	0	5	25	26	0	0	0	43	18	8
G 403		G1-15 Do you subtract hexadecimal numbers	0	5	25	26	0	0	0	42	19	8

0180 40c. Binary Code Systems B

G 404		G1-16 Do you use binary coded decimal (BCD)	0	5	32	32	0	1	0	52	27	9
G 405		G1-17 Do you use gray codes	0	0	14	26	0	0	0	19	6	2
G 406		G1-18 Do you use ICAO codes	0	0	0	11	0	0	0	3	1	0
G 407		G1-19 Do you use excess-3 (XS3) codes	0	0	14	11	0	0	0	6	1	0
G 408		G1-20 Do you use parity bit codes	0	0	32	32	0	0	0	35	11	7
G 409		G1-21 Do you use binary codes	0	0	4	5	0	0	0	6	1	0
G 410		G1-22 Do you use ASCII codes	0	16	36	11	1	0	1	51	29	14
G 411		G1-23 Do you use EBCDI codes	0	0	4	5	0	0	0	9	13	10

0181 41. Digital Logic Functions (Main Logic Gates and Flip-Flops)

0182 41a. Theory of operation B

G 412		G1-24 Do you trace data flow through logic symbol diagrams	7	21	71	53	0	2	0	63	16	6
G 413		G1-25 Do you trace data flow through logic schematic diagrams	14	21	75	37	0	2	0	60	12	4

D T Y	Task Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
G 440	GI-52	Do you perform tasks on TTL (transistor transistor logic)	3	5	14	5	0	0	0	58	3	0
G 441	GI-53	Do you perform tasks on ECL/CHL (emitter coupled or current mode logic)	0	0	11	5	0	0	0	18	2	0
G 442	GI-54	Do you perform tasks on HTL (high threshold logic)	0	0	0	5	0	0	0	16	1	0
G 443	GI-55	Do you perform tasks on CMOS (complementary metal oxide semiconductor)	0	0	11	5	0	0	0	53	2	0
G 444	GI-56	Do you perform tasks on positive MOS ICs	0	0	4	5	0	0	0	17	1	0
G 445	GI-57	Do you perform tasks on negative MOS ICs	0	0	4	5	0	0	0	17	1	0
G 446	GI-58	Do you perform tasks on vertical MOS ICs	0	0	0	5	0	0	0	8	1	0

0186 42. Boolean Equations

0187 42a. Diagram to equation

B

G 435 GI-47 Do you develop Boolean equations from logic circuits or diagrams

0 0 14 0 0 0 0 0 0 0 26 2 0

0188 42b. Equation to diagram

B

G 436 GI-48 Do you develop logic diagrams from Boolean equations

0 0 14 0 0 0 0 0 0 0 24 1 0

0189 42c. Simplify Expressions

G 437 GI-49 Do you simplify Boolean expressions using Boolean algebra

0 0 11 0 0 0 0 0 0 0 24 2 1

0190 43. Computers

0191 43a. Operation principles

B

G 447 G2-1 Do you trace block or schematic diagrams of computer controlled or computer based systems

14 16 68 63 1 2 1 65 18 10

G 454 G2-8 Do you perform tasks on analog computers

38 5 14 21 3 2 3 20 19 6

G 455 G2-9 Do you perform tasks on digital computers

24 16 89 68 3 3 3 74 67 39

D	T Task	Y Nbr	Task Title	456	457	457	461	462	463	991	991	991
				X2A	X2B	X3A	X3C	50	50	04	05	06
0192	43b.		Load programs	2b								
G 448	G2-2		Do you load programs	0	21	82	79	8	5	9	71	5 48
0193	43c.		Write/debug programs	2b								
G 449	G2-3		Do you write or debug programs	0	5	11	0	2	1	3	36	30 26
G 453	G2-7		Do you use computer flow charts or diagrams	0	11	54	32	2	2	3	56	27 18
0194	43d.		Fault isolation	2b								
G 450	G2-4		Do you troubleshoot computers to a major unit	10	16	64	68	1	1	2	63	23 13
G 451	G2-5		Do you troubleshoot computers to a subassembly or circuit card	17	21	36	0	0	1	1	62	7 3
0195	43e.		Circuit troubleshooting	2b								
G 452	G2-6		Do you troubleshoot computer subassembly or circuit card to circuit level components or IC	3	5	4	0	0	0	1	42	2 1
0196	43f.		Types of memories	B								
G 466	G2-20		Do you perform tasks on magnetic (tape, disc, core) computer memories	0	16	68	53	9	4	6	67	67 47
G 467	G2-21		Do you perform tasks on semiconductor (RAM, ROM, EPROM, PROM) computer memories	0	0	54	42	3	1	3	65	35 24
G 468	G2-22		Do you perform tasks on paper (tape, punch card) computer memories	0	16	21	5	2	1	1	13	28 9
G 469	G2-23		Do you perform tasks on advanced technology (bubble, CCD, electron beam, laser, thin film) computer memories	0	0	7	5	0	0	1	24	7 2
0197	43g.		Peripheral devices	B								
G 470	G2-24		Do you perform tasks on computer keyboards	0	16	61	58	15	9	14	70	72 61
G 471	G2-25		Do you perform tasks on computer character printers	0	5	39	5	9	4	10	58	46 43
G 472	G2-26		Do you perform tasks on magnetic tape drives	0	5	46	16	3	1	2	65	54 36

D	T Tsk	Y Nbr	Task Title	456	456	457	457	461	462	463	991	991	991
				X2A	X2B	X3A	X3C	50	50	50	04	05	06
G 473			Do you perform tasks on microprocessor computer terminals	0	5	29	5	6	1	5	49	52	45
G 474			Do you perform tasks on video display unit (VDU/monitor:)	0	5	43	47	8	4	7	39	50	42
G 475			Do you perform tasks on paper tape readers/punches	0	5	14	5	1	0	1	8	31	3
G 476			Do you perform tasks on paper card readers/punches	0	0	4	0	0	0	0	3	7	1
G 477			Do you perform tasks on toggle or push button switch inputs	0	0	39	32	2	2	3	47	34	9
G 478			Do you perform tasks on incandescent displays (Nixie tubes, LEDs, LCDs)	0	5	36	11	1	1	1	42	19	8
G 479			Do you perform tasks on modems	0	0	14	11	4	2	4	41	36	13
G 480			Do you perform tasks on line printers	0	0	21	5	9	4	9	44	45	42
G 481			Do you perform tasks on floppy disc drives	0	0	21	5	12	4	10	39	59	53
G 482			Do you perform tasks on removable cartridge disc drives	0	0	18	0	3	1	3	18	32	24
G 483			Do you perform tasks on removable pack disc drives	0	0	4	0	2	0	1	43	33	14
G 484			Do you perform tasks on fixed Winchester type disc drives	0	0	7	0	4	1	2	28	23	23

0198 43h. Programming languages

G 456	G2-10	Do you use Basic computer language	3	0	18	0	9	4	9	31	32	35
G 457	G2-11	Do you use COBOL computer language	0	0	4	0	1	0	0	2	1	3
G 458	G2-12	Do you use FORTRAN computer language	0	0	11	0	1	0	1	8	24	30
G 459	G2-13	Do you use ADA computer language	0	0	0	0	0	0	0	2	10	6
G 460	G2-14	Do you use ATLAS computer language	0	0	0	11	0	0	1	0	0	0
G 461	G2-15	Do you use ELAN computer language	0	0	0	0	0	0	0	0	0	0
G 462	G2-16	Do you use PASCAL computer language	0	0	0	5	1	0	0	3	9	9
G 463	G2-17	Do you use RPG computer language	0	0	0	0	0	0	0	0	1	1
G 464	G2-18	Do you use Machine computer language	0	0	4	11	1	0	2	37	12	8
G 465	G2-19	Do you use C computer language	0	0	0	0	1	0	0	2	13	4

0199 44. Microprocessor Controlled Systems

0200 44a. Theory of operation F

G 485	G2-39	Do you trace block or schematic diagrams of microprocessor controlled systems	0	5	29	21	0	0	0	53	7	3
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D	T Task	Task Title	456	456	457	457	461	462	463	991	991	991
Y Nbr			X2A	X2B	X3A	X3C	50	50	50	04	05	06
0201	44b.	Isolate faulty microprocessors	2b									
G 486	G2-40	Do you troubleshoot microprocessor controlled systems to a subassembly or circuit card	0	5	11	0	0	0	0	47	4	3
G 487	G2-41	Do you troubleshoot microprocessor controlled systems to isolate a faulty microprocessor	0	0	4	0	0	0	0	35	1	2
0202	45.	Logic Circuits										
0203	45a.	Theory of operation										
0204	45a(1).	Counters (Synchronous/Asynchronous-Up/Down counters)	B									
G 488	G3-1	Do you trace data flow through circuits containing counters	3	5	18	5	0	0	0	50	6	0
G 491	G3-4	Do you perform tasks on UP counters in logic circuits	3	5	11	5	0	0	0	42	5	0
G 492	G3-5	Do you perform tasks on DOWN counters in logic circuits	3	5	11	5	0	0	0	40	4	0
G 493	G3-6	Do you perform tasks on DECADE counters in logic circuits	0	0	11	5	0	0	0	39	3	0
G 494	G3-7	Do you perform tasks on ring counters in logic circuits	0	0	11	5	0	0	0	22	2	0
G 495	G3-8	Do you perform tasks on modulus counters in logic circuits	0	0	4	0	0	0	0	13	2	0
G 496	G3-9	Do you perform tasks on synchronous (parallel) counters in logic circuits	3	0	4	5	0	0	0	38	2	0
G 497	G3-10	Do you perform tasks on asynchronous (serial) counters in logic circuits	3	0	4	5	0	0	0	39	2	0
0205	45a(2).	Registers (Shift and Storage)	B									
G 498	G3-11	Do you trace logic diagrams of circuits containing registers	0	0	21	5	0	0	0	48	5	0
G 501	G3-14	Do you perform tasks on shift registers in logic circuits	0	0	21	5	0	0	0	42	4	0

D T Task
 Y Nbr Task Title
 G 502 G3-15 Do you perform tasks on storage registers
 in logic circuits

456 456 457 457 461 462 463 991 991 991
 X2A X2B X3A X3C 50 50 50 04 05 06
 0 0 14 5 0 0 0 0 44 5 0

0206 45a(3). Combinational Logic Circuits B
 (Half-adder, Full-adder, encoder,
 Decoder, Multiplexer, Demultiplexer,
 Count Detect)

G 503 G3-16 Do you trace data flow through combinational logic
 circuits
 G 506 G3-19 Do you perform tasks on encoders
 G 507 G3-20 Do you perform tasks on decoders
 G 508 G3-21 Do you perform tasks on multiplexers
 G 509 G3-22 Do you perform tasks on demultiplexers
 G 510 G3-23 Do you perform tasks on comparators
 G 511 G3-24 Do you perform tasks on parity generators or checkers
 G 512 G3-25 Do you perform tasks on code converters
 G 513 G3-26 Do you perform tasks on adders
 G 514 G3-27 Do you perform tasks on subtractors
 G 515 G3-28 Do you perform tasks on count detect circuits

3 11 29 5 0 0 0 0 44 4 1
 0 0 21 5 1 0 1 40 2 0
 0 0 21 5 1 0 1 39 2 0
 0 11 32 5 0 0 0 45 3 1
 0 5 29 5 0 0 0 40 2 1
 3 5 21 5 0 0 0 40 2 0
 0 5 25 5 0 0 0 37 2 0
 0 0 11 5 0 0 0 21 1 0
 0 5 14 5 0 0 0 32 1 0
 0 5 14 5 0 0 0 30 1 0
 0 0 11 5 0 0 0 26 2 1

0207 45b. Isolate faulty circuits 2b

G 489 G3-2 Do you troubleshoot counter circuits to isolate a
 faulty counter
 G 499 G3-12 Do you troubleshoot circuits containing registers to
 isolate a faulty register
 G 504 G3-17 Do you troubleshoot to isolate a faulty combinational
 logic circuit

3 5 14 0 0 1 0 43 2 0
 0 0 18 0 0 0 0 38 1 0
 3 11 25 0 0 0 0 39 1 0

0208 45c. Troubleshoot circuits

G 490 G3-3 Do you troubleshoot counters to circuit level
 components
 G 500 G3-13 Do you troubleshoot registers to circuit level
 components
 G 505 G3-18 Do you troubleshoot combinational logic circuits to
 circuit level components

0 0 4 0 0 0 0 36 2 0
 0 0 4 0 0 0 0 31 1 0
 0 5 4 0 0 0 0 33 0 0

D
 T Task
 Y Nbr Task Title
 456 456 457 457 461 462 463 991 991 991
 X2A X2B X3A X3C 50 50 50 04 05 06

0209 46. D/A, A/D Converters (Approx D/A and Ramp A/D)

0210 46a. Theory of operation B
 G 516 G4-1 Do you trace data flow through A/D converters
 G 517 G4-2 Do you trace data flow through D/A converters
 G 520 G4-5 Do the converters you perform tasks on use flash conversion
 G 521 G4-6 Do the converters you perform tasks on use successive approximation conversion
 G 522 G4-7 Do the converters you perform tasks on use ramp conversion
 G 523 G4-8 Do the converters you perform tasks on use R2R conversion

0211 46b. Isolate faulty converters 2b

G 518 G4-3 Do you troubleshoot A/D converter circuits
 G 519 G4-4 Do you troubleshoot D/A converter circuits

0212 47. Transmission Lines

0213 47a. Theory of operation B

H 527 H1-4 Do you construct transmission lines
 H 528 H1-5 Do you match transmission line impedance with loads
 H 531 H1-8 Do you perform tasks on open-wire transmission lines
 H 532 H1-9 Do you perform tasks on twisted pair transmission lines
 H 533 H1-10 Do you perform tasks on twin lead transmission lines
 H 534 H1-11 Do you perform tasks on flexible coaxial transmission lines
 H 535 H1-12 Do you perform tasks on rigid coaxial transmission lines
 H 536 H1-13 Do you perform tasks on fiber-optic transmission lines

D
T Task
Y Mbr

Task Title

456 456 457 457 461 462 463 991 991 991
X2A X2B X3A X3C 50 50 50 04 05 06

0220 49. Microwave Oscillators & Amplifiers

0221 49a. Theory of operation B

H 542	H2-1 Do you trace schematic or block diagrams of circuits containing microwave oscillators or amplifiers	55	32	7	21	0	0	0	4	2	0
H 545	H2-4 Do you perform tasks on two-cavity klystron microwave oscillators and amplifiers	14	5	0	0	0	0	0	0	0	0
H 546	H2-5 Do you perform tasks on three-cavity klystron microwave oscillators and amplifiers	10	0	4	0	0	0	0	0	0	0
H 547	H2-6 Do you perform tasks on reflex klystron microwave oscillators and amplifiers	41	0	0	0	0	0	0	1	0	0
H 548	H2-7 Do you perform tasks on traveling wave tube microwave oscillators and amplifiers	0	0	7	5	0	0	0	1	0	0
H 549	H2-8 Do you perform tasks on magnetron microwave oscillators and amplifiers	55	32	7	0	0	0	0	1	0	0
H 550	H2-9 Do you perform tasks on backward wave oscillator	0	0	0	0	0	0	0	1	0	0
H 551	H2-10 Do you perform tasks on parametric amplifiers	0	5	0	5	0	0	0	0	0	0
H 552	H2-11 Do you perform tasks on yttrium iron garnet (YIG) tuned microwave oscillators and amplifiers	0	0	0	5	0	0	0	0	0	0

0222 49b. Tune or Adjust 2b

H 544	H2-3 Do you tune or adjust microwave oscillators or amplifiers	48	32	4	0	0	0	0	5	0	0
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0223 49c. Isolate faulty microwave oscillators 2b or amplifiers

H 543	H2-2 Do you troubleshoot circuits to isolate a faulty microwave oscillator or amplifier	48	32	7	5	0	0	0	4	0	0
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0224 50. Resonant Cavities

D	T	Task Title	456	456	457	461	462	463	991	991	991
Y	Nbr		X2A	X2B	X3A	X3C	50	50	56	04	05
											06
0225	50a.	Theory of operation	B								
H 553	H3-1	Do you trace schematic or block diagrams of circuits containing resonant cavities	48	21	11	11	0	0	0	5	0
H 558	H3-6	Do you perform tasks on probe resonant cavities	7	5	4	5	0	0	0	1	0
H 559	H3-7	Do you perform tasks on loop resonant cavities	3	0	0	5	0	0	0	1	0
H 560	H3-8	Do you perform tasks on aperture (iris/window) resonant cavities	10	0	4	5	0	0	0	1	0
0226	50b.	Isolate faulty resonant cavities	2b								
H 554	H3-2	Do you troubleshoot circuits to isolate a faulty resonant cavity	41	21	11	0	0	0	0	3	0
H 557	H3-5	Do you measure frequency of resonant cavities	34	21	7	5	0	0	0	3	0
0227	50c.	Tune/adjust	2b								
H 555	H3-3	Do you tune or adjust resonant cavities electrically	34	16	11	0	0	0	0	4	0
H 556	H3-4	Do you tune or adjust resonant cavities physically	59	16	4	0	0	0	0	4	0
0228	51.	Transmitters									
0229	51a.	Theory of operation									
0230	51a(1).	Amplitude Modulation									
H 561	H4-1	Do you use "AM" modulation principles	3	0	0	26	0	0	0	6	2
H 562	H4-2	Do you trace block diagrams of AM transmitters	3	0	0	37	0	0	0	7	1
H 563	H4-3	Do you trace block diagrams of AM transmitter subassemblies or circuit cards	7	0	0	5	0	0	0	7	0
H 564	H4-4	Do you trace schematic diagrams of AM transmitter subassemblies or circuit cards	7	0	0	5	0	0	0	8	0
H 568	H4-8	Do you align or adjust AM transmitters or circuits	3	0	0	0	0	0	0	5	0
H 569	H4-9	Do you calculate percentage of modulation for AM transmitters	3	0	0	0	0	0	0	6	0

D
 T Task
 Y Nbr Task Title

0231 51a(2). Frequency Modulation

H 593 H4-33 Do you use "FM" modulation principles
 H 594 H4-34 Do you trace block diagrams of FM transmitters
 H 595 H4-35 Do you trace block diagrams of FM transmitter
 subassemblies or circuit cards
 H 596 H4-36 Do you trace schematic diagrams of FM transmitter
 subassemblies or circuit cards
 H 600 H4-40 Do you align or adjust FM transmitters or circuits
 H 601 H4-41 Do you calculate modulation index for FM transmitters
 H 602 H4-42 Do you measure frequency deviation for FM transmitters

0232 51a(3). Single Side Band

H 578 H4-18 Do you trace block diagrams of single side band (SSB)
 transmitters
 H 579 H4-19 Do you trace block diagrams of SSB
 transmitter subassemblies or circuit cards
 H 580 H4-20 Do you trace schematic diagrams of SSB
 transmitter subassemblies or circuit cards
 H 584 H4-24 Do you align or adjust SSB transmitters or circuits
 H 585 H4-25 Do you calculate percentage of modulation for SSB
 transmitters

0233 51a(4). Pulse Modulation

H 612 H4-52 Do you use "PM" modulation principles
 H 613 H4-53 Do you trace block diagrams of PM transmitters
 H 614 H4-54 Do you trace block diagrams of PM transmitter
 subassemblies or circuit cards
 H 615 H4-55 Do you trace schematic diagrams of PM trans-
 mitter subassemblies or circuit cards
 H 619 H4-59 Do you align or adjust PM transmitters or circuits
 H 620 H4-60 Do you calculate pulse recurrence time (PRT)
 or pulse recurrence frequency (PRF) for PM transmitters
 H 621 H4-61 Do you measure PRT, PRF or pulse width
 for PM transmitters

D T Y	Task Title												
		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	463 50	491 04	491 05	491 06	491 06
H 573	H4-13 Do you trace schematic diagrams of AM receiver subassemblies or circuit cards	3	0	0	5	0	0	0	0	12	1	0	0
H 577	H4-17 Do you align or adjust AM receivers or circuits	3	0	0	0	0	0	0	0	12	2	0	0

0239	52a(2). Frequency Modulation												
H 603	H4-43 Do you use "FM" demodulation principles	17	0	0	42	1	1	1	1	24	3	0	0
H 604	H4-44 Do you trace block diagrams of FM receivers	21	5	4	37	0	0	0	0	26	4	0	0
H 605	H4-45 Do you trace block diagrams of FM receiver subassemblies or circuit cards	21	0	4	5	0	0	0	0	19	1	0	0
H 606	H4-46 Do you trace schematic diagrams of FM receiver subassemblies or circuit cards	7	0	4	0	0	0	0	0	19	1	0	0
H 610	H4-50 Do you align or adjust FM receivers or circuits	10	0	4	0	0	0	0	0	26	2	0	0
H 611	H4-51 Do you plot receiver signal level curves (RSL) for FM receivers	7	0	0	11	0	0	0	0	8	0	0	0

0240	52a(3). Single Side Band												
H 586	H4-26 Do you trace block diagrams of SSB receivers	0	0	0	16	0	0	0	0	3	1	0	0
H 587	H4-27 Do you trace block diagrams of SSB receiver subassemblies or circuit cards	0	0	0	0	0	0	0	0	3	1	0	0
H 588	H4-28 Do you trace schematic diagrams of SSB receiver subassemblies or circuit cards	0	0	0	0	0	0	0	0	3	1	0	0
H 592	H4-32 Do you align or adjust SSB receivers or circuits	0	0	0	0	0	0	0	0	2	1	0	0

0241	52a(4). Pulse Modulation												
H 622	H4-62 Do you use "PM" demodulation principles	7	0	4	37	0	0	0	0	9	1	0	0
H 623	H4-63 Do you trace block diagrams of PM receivers	17	5	14	37	0	0	0	0	10	2	0	0
H 624	H4-64 Do you trace block diagrams of PM receiver subassemblies or circuit cards	17	5	11	5	0	0	0	0	9	0	0	0
H 625	H4-65 Do you trace schematic diagrams of PM receiver subassemblies or circuit cards	14	0	7	0	0	0	0	0	9	0	0	0
H 629	H4-69 Do you align or adjust PM receivers or circuits	17	5	7	0	0	0	0	0	7	0	0	0

0242	52b. Isolate faulty receivers												
H 574	H4-14 Do you troubleshoot AM receivers to major units	3	0	0	26	0	0	0	0	9	0	0	0
H 575	H4-15 Do you troubleshoot AM receivers to subassemblies or circuit cards	3	0	0	0	0	0	0	0	8	0	0	0
H 589	H4-29 Do you troubleshoot SSB receivers to major units	0	0	0	16	0	0	0	0	2	0	0	0

PM0038

D T Y	Task Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
H	590	H4-30 Do you troubleshoot SSB receivers to sub-assemblies or circuit cards	0	0	0	0	0	0	0	2	0	0
H	607	H4-47 Do you troubleshoot FM receivers to major units	14	0	4	37	0	0	0	23	1	0
H	608	H4-48 Do you troubleshoot FM receivers to subassemblies or circuit cards	3	0	4	0	0	0	0	14	1	0
H	626	H4-66 Do you troubleshoot PM receivers to major units	14	0	11	37	0	0	0	8	0	0
H	627	H4-67 Do you troubleshoot PM receivers to subassemblies or circuit cards	14	0	7	5	0	0	0	8	0	0

0243 52c. Troubleshoot circuits -----

Item	QTY	DESCRIPTION	UNIT	PRICE	TOTAL
H 576	3	H4-16 Do you troubleshoot AM receiver subassemblies or circuit cards to circuit level components	0	0	0
H 591	0	H4-31 Do you troubleshoot SSB receiver subassemblies or circuit cards to circuit level components	0	0	0
H 609	7	H4-49 Do you troubleshoot FM receiver subassemblies or circuit cards to circuit level components	0	4	0
H 628	10	H4-68 Do you troubleshoot PM receiver subassemblies or circuit cards to circuit level components	0	4	0

0244 53. Transmission Power

0245 53a. Perform measurements

[illegible]

0246 53b. Calculations B

	I2-1	Do you calculate RF apparent power				
	I2-2	Do you calculate RF true power				
	I2-3	Do you calculate RF power loss or gain in db				
I 665						
I 666	7	21	0	32	0	0
I 667	10	21	0	26	0	0
	52	37	7	42	0	1
						15
						8
						9
						0
						0
						0

D	T	Task Title	456	456	457	457	461	462	463	991	991	991
Y	Nbr		X2A	X2B	X3A	X3C	50	50	50	04	05	06

0247 54. Antennas

0248 54a. Theory of operation

H 634	H5-5	Do you plot graph radiation patterns	7	5	0	5	0	0	0	0	3	0
H 637	H5-8	Do you work with Yagi antennas	3	0	0	11	0	0	0	10	1	0
H 638	H5-9	Do you work with dipole antennas	79	26	7	37	0	0	0	24	2	0
H 639	H5-10	Do you work with slot antennas	3	0	0	11	0	0	0	1	1	0
H 640	H5-11	Do you work with rotary antennas	52	11	0	5	0	0	0	1	1	0
H 641	H5-12	Do you work with hertz antennas	3	0	0	0	0	0	0	2	1	0
H 642	H5-13	Do you work with marconi antennas	0	0	0	0	0	0	0	3	1	0
H 643	H5-14	Do you work with rhombic antennas	0	0	0	0	0	0	0	3	1	0
H 644	H5-15	Do you work with scimitar antennas	0	0	0	0	0	0	0	0	1	0
H 645	H5-16	Do you work with parabolic antennas	86	5	11	21	0	0	0	8	1	0
H 646	H5-17	Do you work with ground plane antennas	3	0	0	5	0	0	0	8	1	0
H 647	H5-18	Do you perform tasks on rotary antenna arrays	38	16	0	0	0	0	0	0	0	0
H 648	H5-19	Do you perform tasks on stacked (end fire) antenna arrays	0	0	0	0	0	0	0	8	0	0
H 649	H5-20	Do you perform tasks on broadside antenna arrays	0	0	0	0	0	0	0	1	0	0
H 650	H5-21	Do you perform tasks on cardioid antenna arrays	0	0	0	0	0	0	0	2	0	0
H 651	H5-22	Do you perform tasks on collinear antenna arrays	0	0	0	5	0	0	0	5	0	0
H 652	H5-23	Do you perform tasks on phase antenna arrays	24	0	29	84	0	0	0	1	1	0
H 653	H5-24	Do you perform tasks on planar antenna arrays	7	0	0	5	0	0	0	1	0	0
H 654	H5-25	Do you perform tasks on antennas with vertical polarization	17	5	14	58	0	0	0	12	2	0
H 655	H5-26	Do you perform tasks on antennas with horizontal polarization	24	5	14	58	0	0	0	13	2	0
H 656	H5-27	Do you perform tasks on antennas with circular polarization	21	21	25	68	0	0	0	4	1	0
H 657	H5-28	Do you perform tasks on antennas with unidirectional radiation patterns	24	0	4	68	0	0	0	21	2	0
H 658	H5-29	Do you perform tasks on antennas with bidirectional radiation patterns	34	21	14	58	0	0	0	9	1	0
H 659	H5-30	Do you perform tasks on antennas with omnidirectional radiation patterns	21	16	14	74	0	0	0	18	2	0

0249 54b. Perform alignments

H 630	H5-1	Do you physically align antennas	76	42	18	37	1	0	1	24	3	0
H 631	H5-2	Do you electrically align antennas	41	53	18	16	0	0	0	13	3	0
H 636	H5-7	Do you measure standing wave ratio (SWR) for antennas	0	5	7	37	0	0	0	15	0	0

D	Tsk	Task Title	456	456	457	457	461	462	463	991	991	991
Y	Nbr		X2A	X2B	X3A	X3C	50	50	50	04	05	06

0250 54c. Isolate faulty antennas

H 632	H5-3	Do you troubleshoot loading of antennas	14	11	0	42	0	0	0	10	1	0
H 633	H5-4	Do you troubleshoot coupling of antennas	31	32	0	47	0	0	0	16	1	0
H 635	H5-6	Do you troubleshoot antenna components	31	42	18	58	0	0	0	14	0	0

0251 55. Microphones

0252 55a. Theory of operation

J 668	J1-1	Do you trace block diagrams of circuits containing microphones	0	0	0	16	0	0	0	9	0	0
J 669	J1-2	Do you trace schematic diagrams of microphone circuits	0	0	0	5	0	0	0	8	0	0
J 672	J1-5	Do you work on carbon microphones	0	0	0	0	0	0	0	1	0	0
J 673	J1-6	Do you work on capacitor microphones	0	0	0	11	0	0	0	1	0	0
J 674	J1-7	Do you work on crystal microphones	0	0	0	11	0	0	0	2	0	0
J 675	J1-8	Do you work on dynamic microphones	0	0	0	11	0	0	0	6	0	1
J 676	J1-9	Do you work on velocity ribbon microphones	0	0	0	0	0	0	0	1	0	0

0253 55b. Isolate faulty microphones

J 670	J1-3	Do you troubleshoot to isolate a faulty microphone	0	0	0	16	0	0	1	9	0	1
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0254 55c. Troubleshoot circuits

J 671	J1-4	Do you troubleshoot microphones	0	0	0	0	0	0	0	7	0	1
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0255 56. Speakers

0256 56a. Theory of operation

J 677	J1-10	Do you trace block diagrams of circuits containing speakers	0	0	0	5	0	0	0	24	1	0
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D Task Title
Y Nbr

456 456 457 457 461 462 463 991 991 991
X2A X2B X3A X3C 50 50 04 05 06

J 678 J1-11 Do you trace schematic diagrams of speaker circuits

0 0 0 0 0 0 0 22 0 0

0257 56b. Isolate faulty speakers

J 679 J1-12 Do you troubleshoot to isolate a faulty speaker

0 0 0 5 0 0 1 23 1 2

0258 56c. Troubleshoot circuits

J 680 J1-13 Do you troubleshoot speakers

0 0 0 0 0 0 0 13 0 0

0259 57. Photosensitive Devices

0260 57a. Theory of operation

B

J 681 J2-1 Do you trace block diagrams of circuits containing photosensitive devices

0 0 0 0 0 0 0 33 8 2

J 682 J2-2 Do you trace schematic diagrams of photosensitive device circuits

0 0 0 0 0 0 0 32 4 2

J 684 J2-4 Do you adjust or calibrate photosensitive devices

0 0 4 0 0 0 0 22 2 3

J 685 J2-5 Do you work on photodiodes

0 0 0 0 0 0 0 25 5 0

J 686 J2-6 Do you work on phototransistors

0 0 0 0 0 0 0 22 1 0

J 687 J2-7 Do you work on phototubes

0 0 0 0 0 0 0 8 1 3

J 688 J2-8 Do you work on photo-SCRs

0 0 0 0 0 0 0 3 1 0

J 689 J2-9 Do you work on photocells (Photoconductive or Photovoltaic)

0 0 0 0 0 0 0 19 1 1

0261 57b. Isolate faulty photosensitive devices

2b

J 683 J2-3 Do you troubleshoot to isolate a faulty photosensitive device

0 0 0 0 0 0 0 29 2 2

0262 58. Display Tubes

D	T Tsk	Y Nbr	Task Title	456	456	457	457	461	462	463	991	991	991
				X2A	X2B	X3A	X3C	50	50	50	04	05	06

0263 58a. Theory of operation

J 690	J3-1 Do you trace block diagrams of circuits containing display tubes	0	0	0	5	0	0	0	0	0	2	1	0
J 691	J3-2 Do you trace schematic diagrams of display tubes or circuits	0	0	0	0	0	0	0	0	0	2	0	0
J 693	J3-4 Do you adjust or calibrate display tubes or circuits	0	0	0	0	0	0	0	0	0	3	0	0
J 694	J3-5 Do you work on direct view storage tubes (DVST)	0	5	0	0	0	0	0	0	0	0	0	0
J 695	J3-6 Do you work on multiple mode storage tubes (MMST)	0	0	0	0	0	0	0	0	0	0	0	0
J 696	J3-7 Do you work on scan converter tubes (SCT)	0	0	0	0	0	0	0	0	0	0	0	0

0264 58b. Isolate faulty display tubes

J 692	J3-3 Do you troubleshoot to isolate a faulty display tube	0	0	0	0	0	0	0	0	0	2	0	0
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0265 59. Support Subjects

0266 59a. Safety applicable to electronics B

0267 59b. First aid for electrical shock B

0268 59c. Electrostatic Discharge (ESD) Control B

0269 Tasks not referenced

B 175	B3-4 Do you use audio sine-wave signal generators	7	0	7	11	0	0	0	0	0	43	4	1
B 176	B3-5 Do you use audio non-sinusoidal signal generators	7	0	4	11	0	0	0	0	0	31	0	0
B 177	B3-6 Do you use RF less than 1,000MH signal generators	24	16	7	42	0	0	0	0	0	40	2	1
B 178	B3-7 Do you use RF greater than 1,000MH signal generators	24	16	11	47	0	0	0	0	0	16	2	0
B 179	B3-8 Do you use white noise signal generators	0	0	0	21	0	0	0	0	0	8	0	0
B 180	B3-9 Do you use pattern signal generators	3	0	0	32	1	0	0	0	0	10	1	0

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Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	463 50	491 04	491 05	491 06
B 181 B3-10 Do you use pseudo-random signal generators	3	0	0	26	0	0	0	0	6	1	0
B 182 B3-11 Do you use time mark signal generators	3	0	0	5	0	0	0	0	17	3	0
B 183 B3-12 Do you use multi-function (square/sine/triangular) signal generators	3	32	4	32	0	0	0	0	62	10	1
B 184 B3-13 Do you use TV signal generators	3	0	0	0	1	0	0	0	1	0	0
D 284 D1-10 Do you perform tasks on voltage multipliers (doubblers/triplers)	14	11	21	11	0	1	1	1	31	3	3
D 285 D1-11 Do you perform tasks on DC to DC converters	28	11	21	5	0	1	1	1	65	3	3
D 286 D1-12 Do you perform tasks on inverters (DC to AC converters)	55	16	29	11	1	2	2	2	49	4	2
D 287 D1-13 Do you perform tasks on switching power supplies	3	0	7	5	0	3	3	3	44	3	2
J 697 J4-1 Do you trace block diagrams of TV systems or subassemblies	0	0	7	5	0	1	0	1	1	1	1
J 698 J4-2 Do you trace schematic diagrams of TV systems or component circuits	0	0	7	0	0	1	0	1	1	0	1
J 699 J4-3 Do you troubleshoot TV systems to major subassemblies	0	0	7	5	2	1	0	1	1	0	1
J 700 J4-4 Do you troubleshoot TV systems to circuit level components	0	0	0	0	1	0	0	1	1	0	0
J 701 J4-5 Do you adjust or calibrate TV systems or components	0	0	4	0	0	0	0	0	0	0	3
J 702 J4-6 Do you trace block diagrams of laser systems or subassemblies	0	0	0	0	0	0	0	0	1	1	0
J 703 J4-7 Do you trace schematic diagrams of laser systems or component circuits	0	0	0	0	0	0	0	0	1	0	0
J 704 J4-8 Do you troubleshoot laser systems to major subassemblies	0	0	0	0	1	0	1	1	1	0	0
J 705 J4-9 Do you troubleshoot laser systems to circuit level components	0	0	0	0	0	0	0	0	0	0	0
J 706 J4-10 Do you adjust or calibrate laser systems or components	0	0	0	0	1	0	1	1	1	0	0
J 707 J4-11 Do you trace block diagrams of infrared systems or subassemblies	0	0	7	0	0	0	0	0	1	1	0
J 708 J4-12 Do you trace schematic diagrams of infrared systems or component circuits	0	0	7	0	0	0	0	0	1	0	0
J 709 J4-13 Do you troubleshoot infrared systems to major subassemblies	0	0	7	0	2	0	0	0	1	0	0
J 710 J4-14 Do you troubleshoot infrared systems circuit level components	0	0	0	0	1	0	0	0	0	0	0
J 711 J4-15 Do you inspect, clean, or service infrared systems or components	0	0	7	0	3	0	0	0	1	0	0
J 712 J4-16 Do you adjust or calibrate infrared systems or components	0	0	4	0	1	0	0	0	1	0	0